FLIGHT, FEBRUARY 9, 1933 REG. AT THE G.P.O. AS A NEWSPAPER

FIRST AERO WEEKLY IN THE WORLD

FEB 17 1933

FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

No. 1259
Vol. XXV
No. 6

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EVERY THURSDAY

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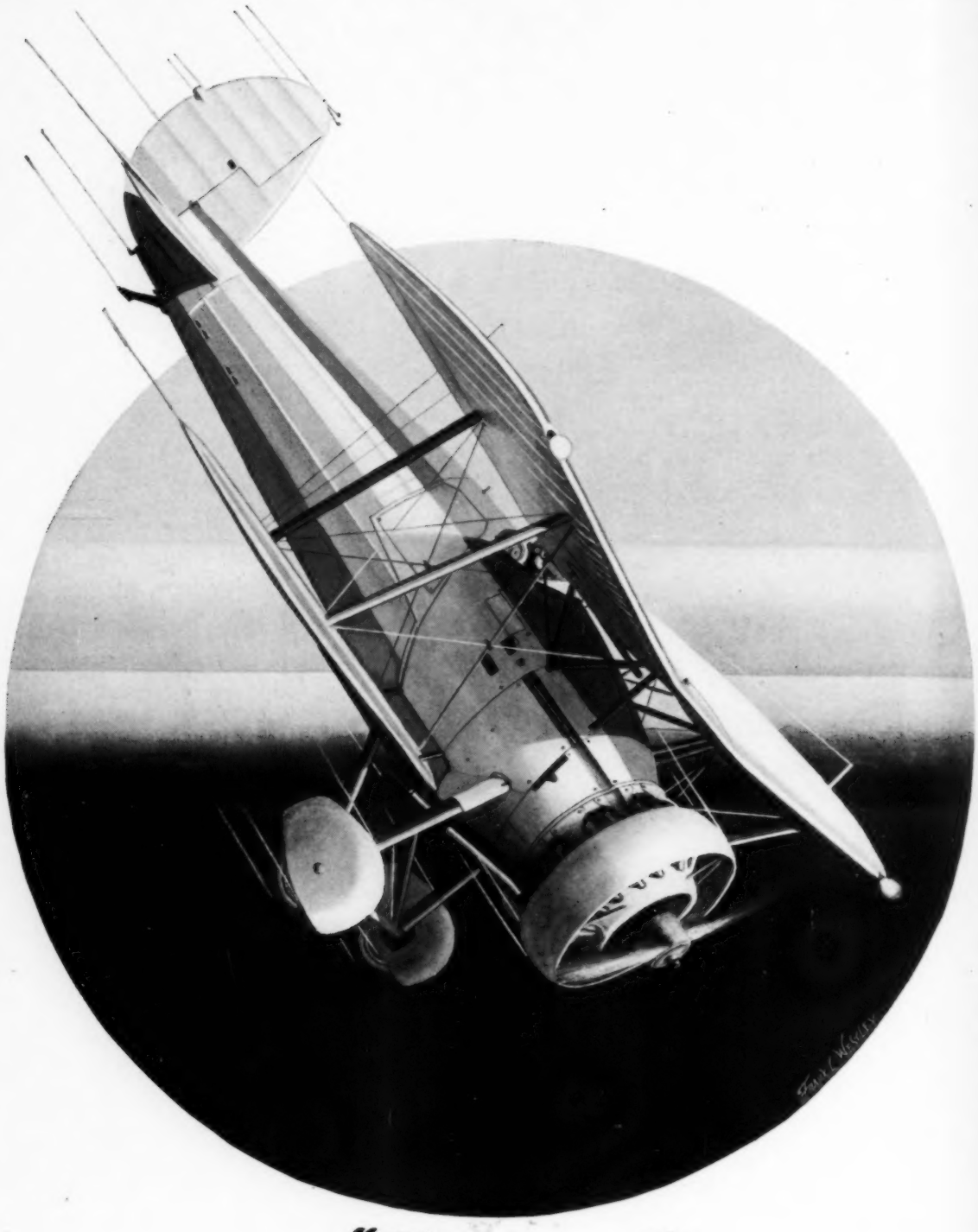

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1259. (Vol. XXV. No. 6.) FEBRUARY 9, 1933 Weekly, Price 6d. Post Free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.
Telephone: (2 lines), Holborn 3211 and 1884.
Telegrams: Truditur, Westcent, London.

Subscription Rates, Post Free.

United Kingdom		United States		Other Countries	
	s. d.				s. d.
3 Months ...	8 3	3 Months ...	$2·20	3 Months ...	8 9
6 ,, ...	16 6	6 ,, ...	$4·40	6 ,, ...	17 6
12 ,, ...	33 0	12 ,, ...	$8·75	12 ,, ...	35 0

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1933.
Feb. 9. Hockey: R.A.F. v. Lincolnshire at Henlow.
Feb. 10. Old Halleyburian R.F.C. Annual Dance, Savoy Hotel.
Feb. 10. Viceroy's Challenge Trophy Race, Delhi.
Feb. 11. Northants Ae.C. Dinner and Dance.
Feb. 12. Northants Ae.C. "At Home."
Feb. 13. "A Review of Air Transport," Lecture by G. E. Woods Humphery before Inst. of Transport.
Feb. 16. "Cloud Formation," Lecture by Sir Gilbert Walker before R.Ae.S.
Feb. 18. Services Rugby: R.A.F. v. R.N., Twickenham 3 p.m.
Mar. 3. No. 25 (F.) Sqd., R.A.F., Re-union Dinner at May Fair Hotel. (Postponed from Jan. 6.)
Mar. 3. Leicester Ae.C. Dance at Palais-de-Dance, Leicester.
Mar. 4. Services Rugby: R.N. v. The Army, Twickenham 3 p.m.
Mar. 8. "Recent Operations in Kurdistan," Lecture by Group-Capt. A. G. R. Garrod before R.U.S.I.
Mar. 9. "Engine Cooling Research." Lecture by R. McKinnon Wood before R.Ae.S.
Mar. 23. "Seaplane Research," Lecture by H. M. Garner before R.Ae.S.
Mar. 24. Bristol and Wessex Ae.C. Dance at Grand Spa Hotel.
Mar. 25. Services Rugby: R.A.F. v. The Army, Twickenham 3 p.m.
Mar. 29. "The East African Dependencies." Lecture by H. F. Melland before R.U.S.I. Chairman, Air Vice-Marshal Sir V. Vyvyan.
May 10. Kent Air Pageant and Opening of Maidstone Aerodrome.
May 16-22. International Rally, Vienna.
May 25. Tourist Rally at Wiesbaden.
May 27. Reading Ae.C. Annual "At Home."
May 28. Deutsch de la Meurthe Cup.
June 5. Lincs. Ae.C. Air Pageant and Opening of Aerodrome at Holton-le-Clay, Grimsby.
June 7. Household Brigade Flying Club Meeting.
June 11. International Meeting, Brussels.
June 24. Royal Air Force Display, Hendon.

INDEX FOR VOL. XXIV.

The 8-page Index for Vol. XXIV of "Flight" and "The Aircraft Engineer," January to December, 1932 (with over 6,463 references for "Flight" and 195 references for "The Aircraft Engineer"—6,658 in all), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy, net (1s. 1d. post free).

EDITORIAL COMMENT

RARELY has such an interesting, informative and practical paper been read before the Royal Aeronautical Society as that of Mr. A. Plesman on the Amsterdam-Batavia service of the Royal Dutch Air Lines. The great interest of the paper lies in the fact that this K.L.M. service is a success. Mr. Plesman was not talking about hopes and possibilities but about accomplished facts. Therefore the record of the service deserves serious study, whether one agrees or not that all the reasonings

The K.L.M.

of the K.L.M. management have been wise and ought to be copied. For our part, we hold that success can be achieved by other methods in the future, and we should prefer to see British flying companies adopt other principles and methods, but that in no wise diminishes our admiration for this great K.L.M. success. In fact, we regret the enthusiasm with which some speakers in the subsequent debate stressed alternative methods of running an air line. Mr. Plesman did not come over to London to thrust his own ideas down our throats, but to tell a very interesting story of achievement, and we are glad that the hearty applause at the conclusion of the debate showed the very keen appreciation of the meeting at Mr. Plesman's paper.

In brief, the K.L.M. principles have been to send one machine and crew right through from Amsterdam to Batavia instead of adopting the relay method; to use landplanes with a truly and actually spare engine,

even for crossing the sea; to carry both mails and passengers in the same machine. Mr. Plesman gave his reasons for adopting each of those principles, and we can see the force of each argument, though we still incline to the belief that in some ways still better results can be achieved by different methods. The K.L.M. reasons for sending each machine right through to the East Indies and back are that the expense of maintaining K.L.M. stations or establishments along the route is avoided, and that men are not sentenced to exile in the unhealthy parts of the route, whereas the crew takes a personal interest in seeing that each flight is made a success. A crew makes four flights out and back each year, and gets a good holiday at each end in healthy climates. Moreover, and this is really remarkable, this long route is run efficiently with only six machines—a fact which must seem very deplorable to the Fokker factory. As regards the use of landplanes, even for crossing the sea, FLIGHT, as a matter of principle, deprecates anything which tells against the future of the flying boat. Not only we, but a very large proportion of travellers, would much prefer to cross the Mediterranean in a "Scipio" flying boat rather than in a Fokker landplane. Mr. Plesman's argument is that it is better to ensure that one will stay up in the air than to provide for the possibility of being forced to land in the sea. Admittedly, the costs of operating a flying boat are somewhat higher than those of a landplane, but, on the other hand, land aerodromes do not have to be provided. It is therefore interesting to note the efforts which Imperial Airways are making to provide aerodromes which can be used all the year round along the upper reaches of the Nile, where flying boats are now in use. Mr. Plesman was emphatic that the landplane can only be justified if it is really able to fly on with full load when one engine is out of action. His argument finds its justification in the fact that in 20,000 hr. of flying no K.L.M. machine on the Amsterdam-Batavia route has been forced to land away from an aerodrome.

The K.L.M., said Mr. Plesman, are not interested in the possibilities of the fast special mail-plane. They have done very well with a combined cargo of mails and passengers. We British, on the contrary, are very much interested in the possibilities of the mail-plane. We conceive that with this type of craft the aim should be the very greatest possible speed, with decreased regard for costs of operation. Our vision of the future is an elaborate organisation, with sections lighted for night flying, and, certainly, relays of machines and pilots. It should be impossible for any single hardy pilot, by dint of going without sleep, to outpace our air-mail service from London to Capetown, Calcutta and Melbourne. Whether such a service will in the future prove self-supporting remains to be proved. It may not be necessary for it to be self-supporting. The benefit to commerce may well prove so great that it will be worth while for the Post Offices of the countries served to pay for such a service. There are railways which can never prove self-supporting, but which must be supported by the Government of the country, because without them it would be impossible to run the country at all. Did Sir Roland Hill feel certain that the penny post would turn out a profit to the State when he introduced it, or was he thinking chiefly of the general benefit which it would confer? Our belief in the future of the mail-plane, however, does not impugn the wisdom of the K.L.M. in doing as they have done. They found certain circumstances and shaped their policy accordingly. When in course of time circumstances change, it is not likely that the K.L.M. will hang behind the advance of progress. For the present, the circumstances with which they have to deal are not the same as those which confront British air lines.

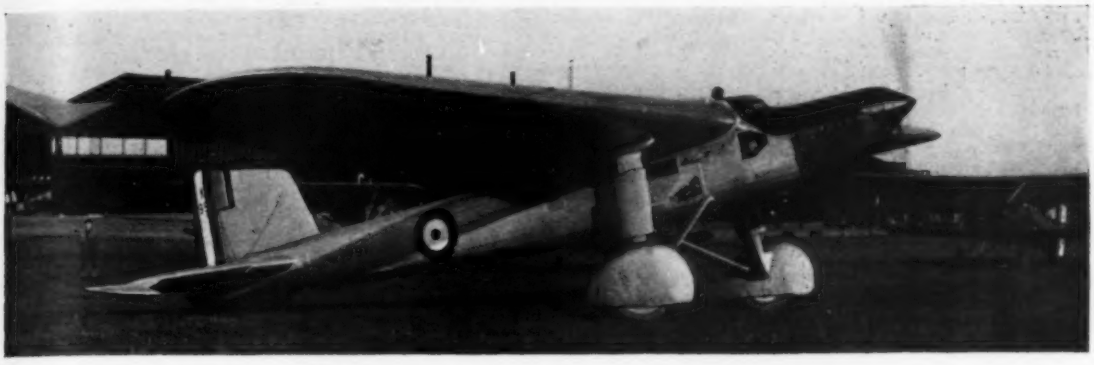
The success of the East Indies air service is attributed by Mr. Plesman in the first place to the helpful policy adopted by the Postmaster-General of Holland. This is very interesting, in view of the complaints brought by the London Chamber of Commerce and others against the British Post Office. The Dutch Post Office pays for a minimum of 500 kg. of mail matter weekly in each direction, whether that amount is actually carried or not. When this amount is not made up, the K.L.M. make a profit and the G.P.O. suffers a loss. But it does not grumble at that loss, because it is that which has made possible the air service. Still, the Post Office tries not to lose more than it can help, and so it is interested to bestir itself and advertise with vigour the advantages to correspondents of using the air mail. As a result 25 per cent. of all first-class mail matter between Holland and the East Indies is carried by the K.L.M., with undoubted advantages to commerce. Imperial Airways have not the same happy arrangement with the British Post Office, and so the results are different. Lt. Col. Barrett-Lennard has worked out the percentages of classes of cargo for Imperial Airways and the K.L.M., and though he had not time to read them out at the discussion, he has kindly sent them to us. They read:—

	K.L.M. Per cent.	I.A.L. Per cent.
Mail	36·27	18·70
Passengers ..	56·75	70·18
Freight ..	6·98	11·12

These figures seem to reflect the different circumstances in which the two companies have to work. Mail looms much larger in the K.L.M. figures than in those of the British company. That was bound to be the result of enthusiasm on the part of one Post Office and scepticism on the part of the other. On the whole, we incline to the view that a mail contract on the lines of that granted by the Holland Post Office is preferable to the direct subsidy granted by our Government. For one thing, though the terms of the contract may be varied as time goes on, there is no reason why a mail contract should ever come to an end; whereas a subsidy certainly must be ended sooner or later. We hope that when Imperial Airways have done with subsidies they may be able to secure a mail contract.

The technical points which Mr. Plesman mentioned were also very interesting—the use of Bakelite plywood in the tropics, the beneficial effect of the Townend ring on the wireless communications, and the value or otherwise of wheel fairings. He made the valuable experience of the K.L.M. available for British consideration, and for that he deserves our heartiest thanks.

Start of Fairey (Napier) Long-distance Monoplane



EARLY on Monday morning, February 6, Sqd. Ldr. O. R. Gayford, D.F.C., and Flt. Lt. G. E. Nicholetts, A.F.C., took off the Fairey (Napier) long-distance monoplane from Cranwell in an attempt to fly non-stop to Capetown and so gain for Great Britain the long-distance record. The existing record stands at 5,012 miles (8,065.736 km.), the distance between New York and Constantinople, set up on July 27-29, 1931, by the American airmen, Boardman and Polando. This must stand until beaten by 100 kilometres, measured along a circle course. The great circle course from Cranwell to Capetown is approximately 6,114 miles, and to beat the world's record the Fairey monoplane must reach a point on its actual route near Zesfontein in British South-West Africa, about 120 miles south of the Cunene river and 5,074 miles on the great circle course from Cranwell.

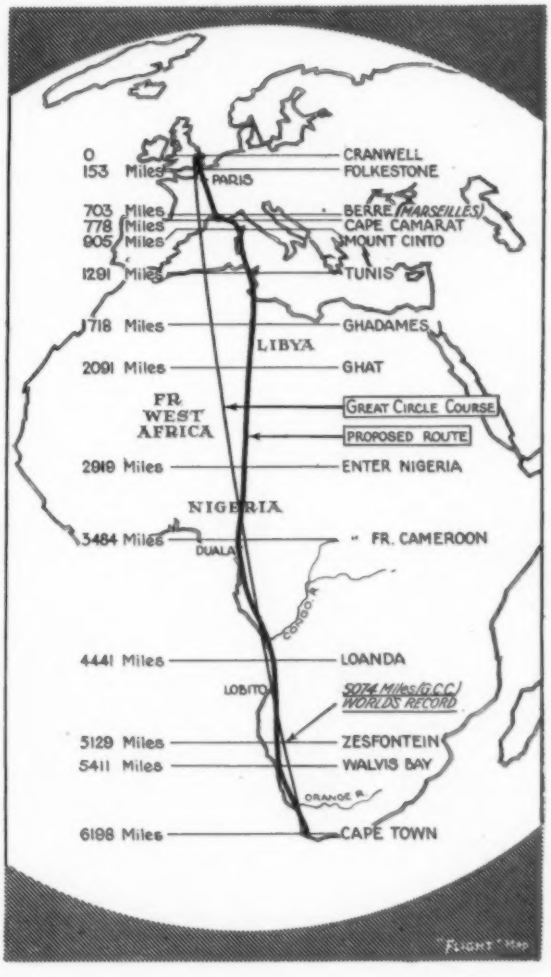
The start took place at 7.12 a.m. in the dim light of the dawn. A special fuel was used in the Napier engine for the take-off. The monoplane ran for 1,600 yards, taking 58 sec. before it lifted off the ground and began to climb very slowly. The air was very bumpy, but gradually the machine reached a safe height.

The monoplane is not flying exactly along the great circle course as that would take it over several formidable mountain ranges. The actual course marked out is 6,198 miles in length. In particular, the course avoids the Atlas mountains on which a former monoplane flown by Sqd. Ldr. Jones-Williams and Flt. Lt. Jenkins crashed with fatal results. It is also designed to avoid the Ahaggar plateau in the Central Sahara. Otherwise the course marked out sticks as closely as possible to the great circle course. Both courses are shown on the accompanying map.

Sqd. Ldr. Gayford and Flt. Lt. Bett were chosen last year as the crew of the monoplane for the Capetown flight, but owing to the unfavourable weather conditions no start was made. Flt. Lt. Bett died recently in Cranwell hospital after an operation, and Flt. Lt. Nicholetts was then chosen to take his place. He was born in 1902 at Bampton, Tiverton, Devon, and was educated at the Royal Naval Colleges of Osborne and Dartmouth. He transferred, however, to the R.A.F., and was sent to Cranwell as a flight cadet. On gaining his commission he served in the Coastal Area, as was natural to a man who had had a naval education. He was posted to the School of Naval Co-operation at Lee-on-the-Solent, to No. 440 (Fleet Reconnaissance) Flight at Leuchars, and was later in Fleet Fighter Flights on the *Eagle* in the Mediterranean. In 1926 he was posted to Donibristle and later to Calshot. In 1927 he was chosen as one of the pilots on the flight of four "Southampton" flying boats which flew from Plymouth to Australia, and afterwards took up their residence at Singapore as No. 205 (F.B.) Squadron. He remained at Singapore until 1931, when he came home and was posted to No. 209 (F.B.) Squadron ("Iris" boats) at Mount Batten. Since then he has been adjutant at No. 2 Flying Training School.

Sqd. Ldr. Gayford enlisted in the R.N.V.R. in August, 1914, and later became an observer in the R.N.A.S. and obtained a commission. He served in the Aegean and afterwards in the Caspian against the Bolsheviks. He

AFTER THAT RECORD: The Fairey Long-distance Monoplane (Napier "Lion" engine), and, below, sketch map of the task it has set out to accomplish. The great-circle course to Capetown is shown in the thin line, and the course actually followed by the machine is indicated by the thick line.



learnt to fly in 1920, and subsequently served in Iraq and Egypt. In 1928 he commanded the flight of Fairey III F. machines of No. 47 (Bomber) Squadron, which carried out the annual R.A.F. flight from Cairo to Capetown and back. This experience should stand him in good stead on his present African flight. In 1930 he graduated at the R.A.F. Staff College at Andover. In October, 1931, he and the late Flt. Lt. Bett made a non-stop flight in the long-range monoplane from Cranwell to Egypt. He is 40 years of age.

The Fairey monoplane is in most respects similar to the former one which crashed near Tunis, but one very important addition is the automatic pilot, which should very considerably relieve the pilots of the strain of keeping the machine on its course, especially during the night and in clouds. Over 1,000 gallons of petrol are carried in tanks in the wing, and the all-up weight of the machine is about 17,000 lb., an increase of 1,000 lb. on the weight of the earlier monoplane when it made its non-stop flight to India in 1929.

The machine, according to the course mapped out, was to fly straight to Berre, near Marseilles, and there coast eastwards to St. Raphael. From there the course lies across Corsica and Sardinia, where it may be necessary to climb to 6,000 ft. to get over the mountains, and then to Tunis. Once the eastern end of the Atlas mountains has been passed, the machine was to fly slightly westwards to get back to the great circle course, and the first night would be spent over the Sahara. Then part of Nigeria would be crossed, then French Cameroon, then Spanish Guinea, then French Equatorial Africa, Portuguese Angola, and then British South-West Africa. Our map shows how the machine will be able to follow the coast for part of the way south of Duala. If all goes well, Capetown should be reached on Wednesday evening after some 60 hr. in the air.

Once the critical moment of the take-off from Cranwell has been passed, as it has at the moment of writing this, the great desideratum is a north wind. Such a wind is usual over great parts of Africa at this time of year, and that is the reason why February at full moon time has been chosen for the attempt.

The monoplane is fitted with a short-wave wireless transmitting set, and it was arranged that it should report progress every two hours on a wavelength of 33.71. It has no receiving set.

In the early stages of the flight the monoplane was able to make very good going, averaging well over 100 m.p.h. ground speed. By 10 a.m. she was nearing Paris, having covered some 350 miles in under 3 hr. By noon she was west of Lyons, 540 miles in under 5 hr. At 14 hr. she reported herself as over Avignon, 665 miles in under 7 hr. Evidently conditions over France had slowed her up a bit. The next report was timed 16 hr. and she was then over the Mediterranean 10 miles S.E. of Marseilles. At 17.40 she was reported over Cagliari in Southern Sardinia, over 1,000 miles in 10 hr. 25 min. At 19.45 she was at Kairwan, 80 miles south of Tunis and past the eastern end of the Atlas mountains (1,375 miles); at 20.55 at Gabes, 210 miles south of Tunis (1,510 miles); and at 23.30 she was 520 miles south of Tunis, about 1,750 miles from Cranwell. Over Northern Africa she had evidently found the much desired northerly wind and had more than made good her losses in France.

On Tuesday morning at 2 a.m. the monoplane reported herself as passing over Rhat, having covered 2,040 miles. At 4 a.m. she had covered 2,263 miles, but was over no definite place. All was well and the machine was on its course. At 6 a.m. she reported again and was then 2,470 miles from Cranwell.

The short wave wireless was giving variable results. Capetown actually received some of the calls from the machine, but could not decipher them. One call when the monoplane was in the Mediterranean area was clearly picked up by a warship at Bathurst. At 12 noon on Tuesday messages were received by the Air Ministry through French official and private stations, which reported that the monoplane was flying on her course but that her position was not known accurately. At 14 hr. on Tuesday a message received via Tunis stated that she had reached the Atlantic coast in Nigeria. Over the interior of Nigeria the weather was cloudless but there was a considerable dust haze, but on the Nigerian coast the visibility varied from 12 to 30 miles. At Kaduna in Northern Nigeria the wind on Tuesday was E.N.E. and was blowing 13 m.p.h. at 3,000 ft., 17 m.p.h. at 5,000 ft., and 27 m.p.h. at 4,000 ft.

In French Equatorial Africa it is now the rainy season, and on Tuesday night the monoplane might expect unsettled weather. At the time of going to press all was well and the prospects good.

THE AIR MINISTER'S TOUR

LORD LONDONDERRY returned to Croydon from his tour on February 1, and next day, at Gwydyr House, he told representatives of the Press some of his impressions. Leaving Croydon on January 11 by Imperial Airways machine, Lord Londonderry covered, in about three weeks, a distance of something like 8,000 miles. Except for the passage through the Alps and across Italy on the way out, and from Rome to Paris on the return journey, the Secretary of State for Air made the entire tour by air. He was full of praise for the comfort and quietness of the Handley Page H.P. 42 and Short "Sylvanus" machines, and said that in future he would certainly choose air travel in preference to other transport whenever possible.

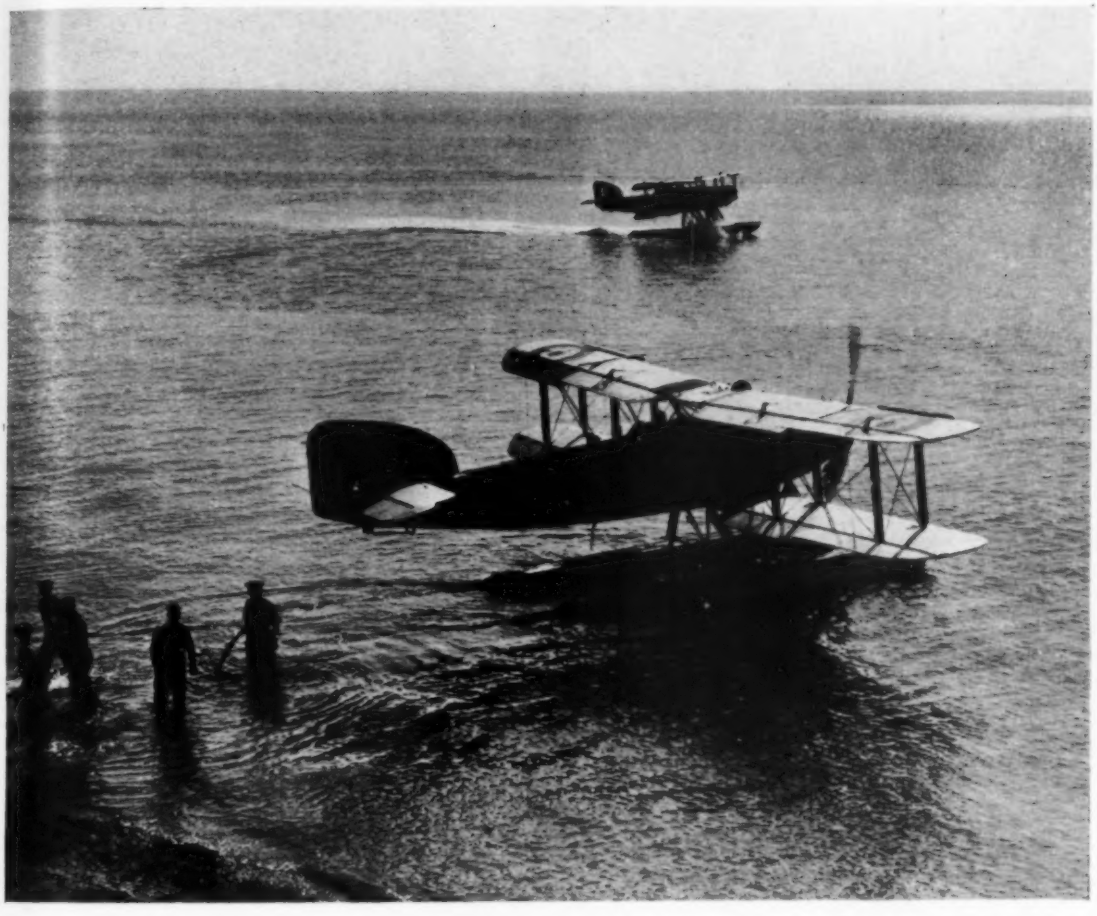
From Cairo to Baghdad Lord Londonderry travelled by service aircraft, and on the return trip by Imperial Airways machine. In Egypt and Iraq he flew in Vickers "Victoria," Westland "Wapiti" and Fairey "Gordon" machines, and at Basra he accompanied the Flying Boat Squadron stationed there (Short "Rangoon"), so that by now the Secretary of State for Air has personal experience of quite a range of aircraft types.

In Egypt he found civil aviation steadily growing, regular transport being represented by Imperial Airways, and private flying and air taxi work by Misr Airwork, the Anglo-Egyptian company founded by the directors of Airwork at Heston. Egypt was starting her own Air Force, and two R.A.F. officers had been lent to the Egyptian government, one as Director of Civil Aviation and the other in charge of the service side. Time did not permit of Lord Londonderry visiting Khartoum and the Sudan, but next year he hoped to visit them, and also India. South of Egypt business men and government officials in Kenya and Tanganyika were coming to regard air travel as the normal method, which saved time and money. The R.A.F. in Egypt did its part with the Army in keeping watch and ward over our communications, and in the Middle East it played the part which the British Navy had for so many years played on the sea. Everywhere he found the greatest keenness and efficiency.

In Iraq Lord Londonderry spent some eight days and saw from the air the varied types of country, such as the rocky Syrian desert, the river country in the centre, the marshes around Basra, and the magnificent mountains of the North and the North-East. He flew over the districts in which for the last two years the R.A.F. had been operating, and saw the villages of the Kurds and their Christian neighbours and sometime enemies the Assyrians. He was glad that the Assyrian difficulty was now on the way to settlement on the lines agreed upon after the recent discussions at Geneva.

On his return journey Lord Londonderry payed a visit to Rome at the invitation of General Balbo, the Italian Air Minister, and called upon Signor Mussolini. He was particularly impressed by the new Italian Air Ministry building in Rome, with all its latest labour-saving devices, and mentioned that lunch was served for all, from General Balbo downwards, in one of the large dining rooms. 40 minutes was the period allowed, and from Lord Londonderry's remarks we gather that Gwydyr House and Adastral House may hear more of this!

Leaving Rome the next morning by train, Lord Londonderry discovered that General Balbo had had the courtesy and thoughtfulness to provide a very pleasant finish to a charming visit by sending a squadron of aeroplanes to escort the train over the first 50-60 miles of the journey. From Paris Lord Londonderry returned to Croydon by Imperial airliner.



FLEET SPOTTERS : Launching Fairey III.F seaplanes at Lee. (FLIGHT *Photo.*)

Lee-on-the-Solent

The School of Naval Co-operation

By Major F. A. de V. Robertson, V.D.

IT seems a good many years since Wing Com. (now Group Capt.) C. W. H. Pulford brought back the first Cairo-Capetown R.A.F. flight and landed the four Fairey III D seaplanes off Lee-on-Solent. On looking up records, it appears that the actual date of the arrival was June 21, 1926, six and a-half years ago, and that was the last occasion, until the other day, on which the present writer visited Lee. A previous visit had been on the occasion of the King's Cup race in August, 1924, when the pier at Lee was the finishing line. That was a civil occasion, and there was small opportunity to pay attention to the Air Force station. Still, Lee seems a very familiar spot to all who have had to do with Schneider contests. How many hours have we all spent on the Calshot concrete gazing towards Lee and wondering if the water over there was calm enough or rough enough for the racing seaplanes to take off!

The officers, R.A.F. and R.N., who inhabit Lee assert that it is a very accessible spot. So it doubtless is for those who arrive by seaplane. For the greenhorn who comes by train it mildly suggests the centre of Hampton Court maze, with a rapacious taxi-driver as official guide. It may be added that once the R.A.F. station has been discovered, the explorer's adventures and troubles are all forgotten in the very warm hospitality of the officers there. Their mess, or part of it, is in an old school building. Not a co-operation school, but one for either boys or girls; history does not relate which. The poor infants were probably ejected during the war, and they have never been allowed back. Consequently the ante-room does not look in the least like the ante-rooms of most R.A.F. stations, whether of the old war hut variety or of the new R.A.F. sealed pattern. It is extremely comfortable and homelike, and those who live in it are very sad at a report that some time it is to be replaced by a new and more commodious mess house of the new pattern.

If you consult the Air Force List, you will see that Lee-on-Solent is entered as the home of the School of Naval Co-operation. That, of course, is quite correct. The station, however, has more than that one function. In fact, Lee has three functions. The school is one, and with the school goes a training flight. Secondly, the station has a co-operation flight which carries out air duties in connection with the naval units in those waters. Thirdly, Lee is the base for all aircraft which are taken aboard warships other than aircraft carriers. Let us now examine each of these functions in some detail. Before going further it may simplify matters to mention that all the

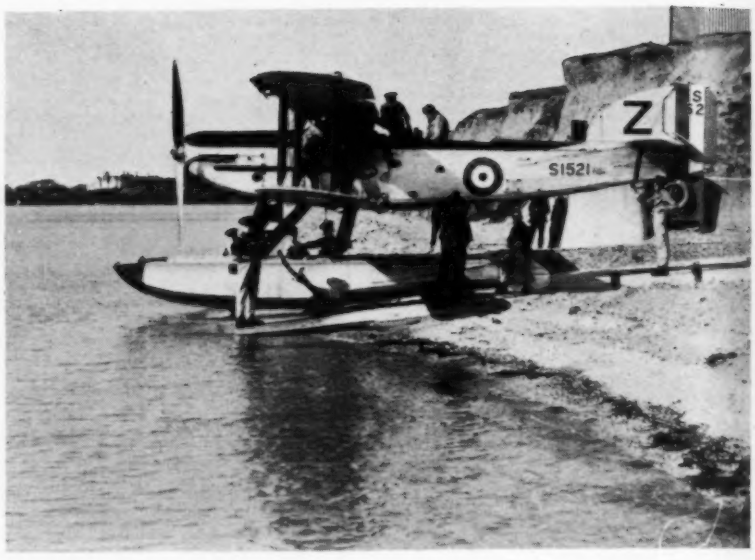
aircraft with which Lee is concerned are floatplanes. Landplanes and ship-planes it knows not. With flying boats it is not concerned. Up till very recently all the machines at Lee were Fairey III F's on floats, but now there has come a variety in "Ospreys," also on floats.

The School and the Training Flight

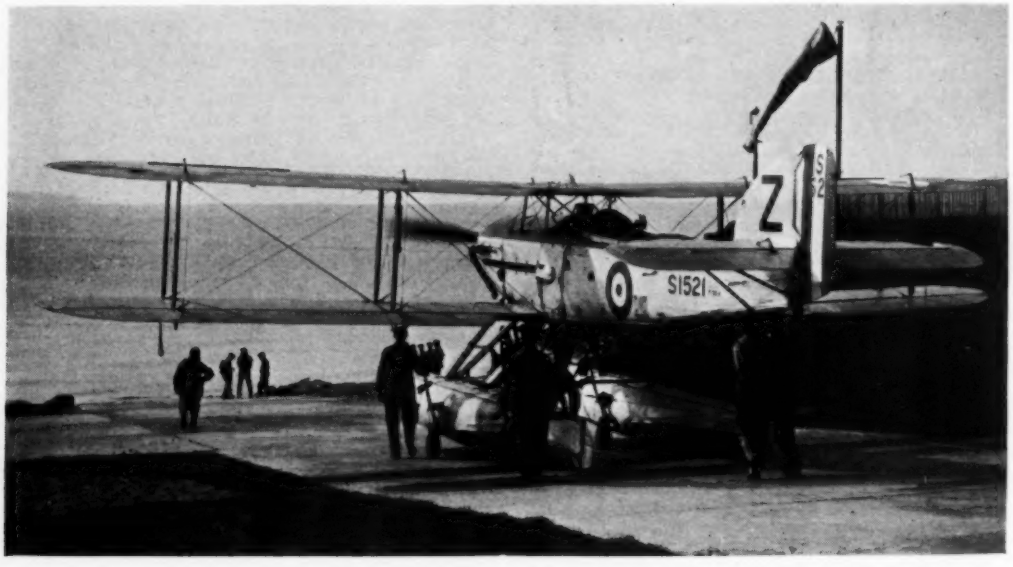
The School of Naval Co-operation is very strictly what its title says that it is. It trains naval officers as observers to work in the Fleet Air Arm. It does not train pilots. Co-operation means to the Navy the work of the observer. Years ago it was decided, by the Balfour Committee, if we remember right, that all observers in naval aircraft should be naval officers. Fleet-spotter machines go up, not to fight or to drop bombs or torpedoes, but (in the vernacular phrase) to "look-see." The Navy says, and it is not for the land-lubber to dispute it, that naval eyes will see what the Admiral wants to know more certainly than the eyes of any other man can do. Not long ago a naval officer, an ex-Captain of a carrier, lecturing before the Royal United Service Institution, said that even a naval man can miss seeing a lot of things at sea and can misunderstand a good deal of what he does see—he may even think he sees things which are not there. A man who was not a sailor would be even more liable to error.

This school, therefore, exists to train only naval officers, and it only trains them as observers. It does teach them a very little about aerodynamics, but it does not teach them anything practical about the flying of an aircraft. There are two courses in a year, and each consists of eight naval officers. Before coming to Lee all the pupils have been at naval establishments. After passing out of the school at Lee they go on board carriers.

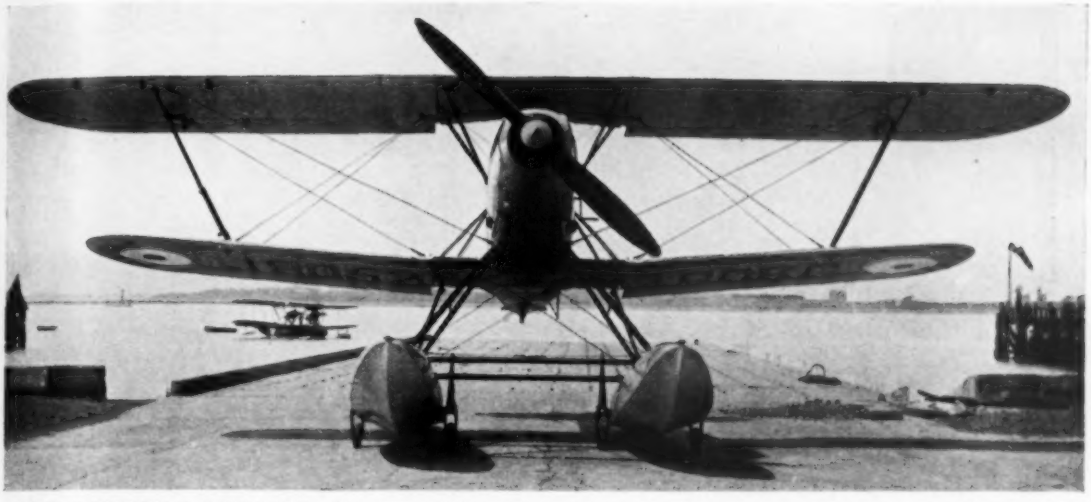
From this it will be seen that the naval observer is a pretty busy man, and is expected to be a highly qualified one. At such subjects as W/T he has to be highly proficient, and able to send messages at high speed. The course at Lee does not consist only of study ashore. The observer pupils are constantly taken up in the Fairey III F machines belonging to the Training Flight. This flight possesses seven of these machines, driven by Napier "Lion" engines. They are three-seaters, and when the observer is engaged in working out a navigation course he is not expected to attend to the wireless as well. That duty is taken over by a naval rating known as Telegraphist Air Gunner (or T.A.G. for short). It will be seen that the liaison between the two Services in the Fleet Air Arm is very thorough. A seaplane on a cruiser is piloted by a naval officer with a temporary commission in the R.A.F. The observer is a naval officer pure and simple, trained at Lee. The T.A.G. is a naval rating. The rigger and fitter are airmen of the R.A.F. On a carrier the pilot may be an officer of the R.A.F. or he may be a naval officer with a temporary R.A.F. commission. The proportion of naval officers to R.A.F. officers



ABOUT TO WET HER TOES: The Fairey III.F floatplanes of the Fleet Air Arm are three-seaters. (FLIGHT *Photo.*)



ON THE SLIPWAY: A Fleet Spotter about to set off on a training flight. (FLIGHT *Photo.*)



THE "OSPREY" SEAPLANE: No. 407 (Fighter Reconnaissance) Flight has recently been re-equipped with Hawker "Ospreys" (Rolls-Royce "Kestrel"), to be catapulted off cruisers. The Flight is to join the 2nd Cruiser Squadron. *(Crown Copyright)*

among pilots on carriers is 70 per cent., but the pilots of catapult seaplanes are invariably naval officers with the temporary R.A.F. commission. As the men are all British, and therefore accustomed by nature to compromises, this scheme works very well.

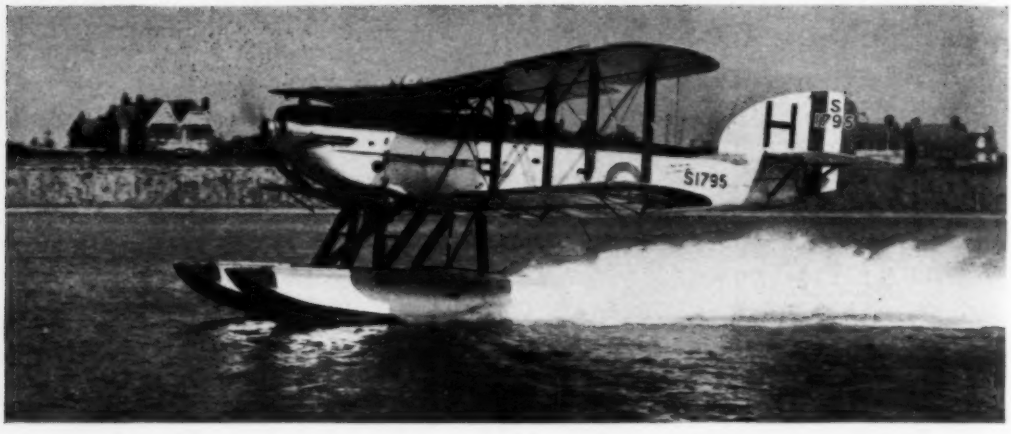
The Co-operation Flight

The gunnery school of Whale Island is known to the Admiralty as H.M.S. *Excellent*. Apparently the Royal Navy is not allowed to have mere shore establishments. Everything has to be a ship. It will be remembered that Cranwell was once H.M.S. *Dædalus*. Naval gunners must have practice in shooting at targets in the air, and somebody has got to tow those targets. This work falls to the lot of the Co-operation Flight at Lee. The flight owns six Fairey III F seaplanes, all with "Lions," of which three are three-seaters and are used for general co-operation work with the Navy, while the other three are used for towing drogue targets for the naval gunners. In these latter the third seat is occupied by the towing gear. This towing cannot be very pleasant work. Of course, it is safe enough with the target all that distance away, and the naval gunners shooting straight, but the target makes the aircraft very soggy to fly. The other three machines find plenty of odd jobs to do for the Navy round Portsmouth.

The Catapult Flights

It was said above that Lee is the base for the flights of the Fleet Air Arm which go on ships other than carriers, and which accordingly fly seaplanes which are launched by catapult, not ship-planes which land on the deck of a carrier. Recently the flights at Lee were Nos. 443 and 444 (Fleet Spotter Reconnaissance) Flights, each using three-seater Fairey III F's on floats. Even when these flights go to sea, they remain based at Lee. When the cruise is over, the flights return to Lee, and their aircraft are overhauled there. Seaplanes which have lived out on a catapult for a whole cruise have had to put up with quite a lot. They are quite accustomed to salt water,

INSTRUCTORS AT THE SCHOOL OF NAVAL CO-OPERATION: Left to right, standing—Flt. Lt. E. Drudge, M.B.E.; Lt. Com. M. Walton; Flt. Lt. J. C. C. Slater; Lt. Com. O. L. Meredith; Flt. Lt. V. F. Whatling, D.S.M.; seated—Sqd. Ldr. G. W. Bentley, D.F.C., Chief Instructor.



TAXYING : No prettier sight could be desired than a seaplane taking off or landing. (FLIGHT *Photo.*)

which is not the best of preservatives, and often they return with sundry patches on the wings where the seagulls have tried to make a meal of the doped fabric. The A.R.S. men at Lee have quite a busy time while the personnel of the flight go on well-earned leave.

No. 407 (Fleet Fighter) Flight has come to Lee to take up the quarters of No. 443 Flight. No. 407 is equipped with "Osprey" seaplanes, which, of course, are two-seaters. The frames of these "Ospreys" are made of stainless-steel tubes. This is a novelty, for though stainless steel has been used in aircraft for years past, it has never before been used in the form of tubes. In other respects the construction is of the normal Hawker type. The stainless steel will naturally save much trouble in the maintenance of seaplanes which have to be exposed to the weather as the catapult machines have to be. No. 407 Flight is to be known henceforth as No. 407 (Fighter Reconnaissance) Flight. It is being established on a basis of five aircraft, passing its other machines over to No. 405 Flight. No. 407 will be reserved for the 2nd Cruiser Squadron, Home Fleet.

The use of "Ospreys" as catapult seaplanes is a novelty in the Fleet Air Arm. The ship-plane form of the "Osprey" is in process of being supplied to flights on carriers as what is called a fighter reconnaissance machine. Hitherto the cruisers and capital ships have only kept spotter reconnaissance types. One could not expect the ordinary reconnaissance machine to hold its own if attacked by enemy fighters, and if it cannot hold its own, or is not protected by fighter machines, its chances of bringing home its information may not be too rosy. The "Osprey" has such an excellent performance that it can be counted on, not only to act as eyes for the Fleet, but to give a very good account of itself if attacked. The seaplane would not be so manœuvrable in a fight as a ship-plane with wheeled undercarriage, but the "Osprey" could give away a bit of performance and still have the better of any enemy machine it could meet in the present

PUPILS : A group of Naval Officers at Lee undergoing instruction as observers for the Fleet Air Arm. They are provided with the naval observer's type of Irving parachute. (FLIGHT *Photo.*)

day. At the worst, it would have a better chance of getting home with its news than the Fairey III F seaplane would have. This innovation shows the progressive spirit which animates the Fleet Air Arm. It cannot be said to have reached anything like its full development. New ideas are constantly being considered and tried out, and future developments are sure to be full of interest.

Royal Air Force Squadrons

Other descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in FLIGHT as follow:—

H.M. Aircraft Carrier *Glorious*. May 16, 1930.
No. 4 (Army Co-operation), South Farnborough; No. 17 (Fighter), Upavon, and No. 33 (Bomber), Eastchurch. June 27, 1930.
No. 601 (County of London) (B.) Sq., A.A.F. (at Lympne). August 15, 1930.
No. 43 (Fighter) Sq. (Tangmere). September 19, 1930.
No. 2 (Army Co-operation) Sq. (Manston). December 19, 1930.
No. 101 (Bomber) Sq. (Andover). April 24, 1931.
Nos. 204 and 209 (Flying-Boat) Sq. (Mount Batten). June 12, 1931.
"1890–1912–1931." (An Outline of the Growth of the R.A.F.) June 26, 1931.
Cambridge University Air Sq. (at Old Sarum). July 10, 1931.
Central Flying School (Wittering). July 17, 1931.
Submarine Aircraft Carrier "M 2." July 31, 1931.
Oxford University Air Sq. (at Eastchurch). August 7, 1931.
No. 600(City of London)(Bomber) Sq.,A.A.F. (at Tangmere). August 21, 1931.
No. 605 (County of Warwick) (Bomber) Sq. (Cas. Bromwich). April 1, 1932.
No. 40 (Bomber) Sq. (Upper Heyford). May 13, 1932.
Nos. 7 and 58 (Bomber) Sq. (Worthy Down). June 10, 1932.
A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet. June 17, 1932.
Oxford University Air Sq. (Eastchurch). July 22, 1932.
Cambridge University Air Sq. (Netheravon). August 5, 1932.
No. 1 Air Defence Group (A.A.F. and Cadre Sqs.). August 12, 1932.
No. 100 (Bomber) Sq. (Donibristle). August 19, 1932.
Scotland's Auxiliaries; No. 602 (City of Glasgow) (Bomber) Sq. and No. 603 (City of Edinburgh) (Bomber) Sq. September 16, 1932.
London's Auxiliaries; Nos. 600, 601, and 604 B. Sq. October 20, 1932.
No. 25 (Fighter) Sq. (Hawkinge). December 8, 1932.
No. 19 (Fighter) Sq. Duxford. January 5, 1933.
Aircraft Carrier H.M.S *Courageous*. January 12 1933.

THE DEUTSCHE DE LA MEURTHE CUP

THIRTEEN entries had been received by the Aero Club de France for the new International Challenge Trophy known as the Deutsch de la Meurthe Cup, when the lists closed on Wednesday, February 1 last. This competition promises to be one of the outstanding aeronautical events of the year.

As already mentioned in FLIGHT, this race will be held on May 28 next, in the district adjoining Paris known as "la Beauce," a large open section of country lying to the south-east of the French capital, in the direction of Orleans. It is intended to be an international speed competition for landplanes and seaplanes (and amphibians) over a course of at least 2,000 km. (1,250 miles). This distance will be divided into two flights of 1,000 km. (625 miles) each, and a landing between them of not more than 90 min. will be allowed.

The entries will be limited to single-seater planes representing recognised clubs, whose engine or engines have a cylinder capacity not to exceed 8 litres (488.2 cu. in.). No change of pilots will be allowed. They must remain throughout the contest. Any kind of fuel can be used. Repairs and refuelling are permitted.

The start of all the participating planes will be made simultaneously, the machines being stationary on the starting line with their engines turning. Each of the participants will be required to prove, at least fifteen days before the date set for the contest, that he has flown at the rate of 200 km./hr. (125 m./hr.) or better over a closed circuit course of 1,000 km. (625 miles). The fuel tanks of his plane must be full at the start of this trial flight.

This Deutsch de la Meurthe Challenge Cup has a value of 21,000 francs (£275), and the sum of 100,000 francs (£1,200) in cash will be awarded the winner in addition. The club which the winning pilot represents will hold the cup until the succeeding contest. These contests must be held once in every two years. The cup will become the property of the club which wins it three times, not necessarily consecutively.

For the first competition of this cup, which will be held on May 28 next, the entries will necessarily be limited to landplanes or amphibians. The course will be laid out over a closed rectangular circuit of 200 km. (125 miles) in length, each of the sides being about 50 km. (31¼ miles) long. The planes will take off and finish at the Etampes Airport, and the circuit will pass over the aerodromes of Chartres and Orleans, the Chateaudun district and the Etampes Airport. This course will be flown five times in each of the two stages of the race.

In view of the technical interest taken in this contest, and to recompense the engineers and constructors, the Air Ministry has announced that it will present additional prizes aggregating 3,000,000 francs to the various contestants of French nationality, provided they fulfil certain conditions of speed and endurance. These contestants must use planes and engines constructed in France, interchangeable equipment parts, such as pneumatic tyres, spark plugs, lighting devices, etc., excepted. These prizes offered by the Air Ministry will be awarded as follows:—

(1) *1,000,000 Francs.*—This sum is to be apportioned among contestants of French nationality who shall maintain an average speed (V) of at least 280 km./hr. (174 m./hr.) for at least 200 km. (125 miles) of the course (L), and which will give a product of L × V = P. This product (P) must amount to at least $1{,}000 \times \frac{280}{4}$. The contestant will then receive a prize of 1,000,000 francs × $\frac{P}{\varepsilon P}$, the maximum award, however, being limited to 250,000 francs.

εP is the sum of the points for the contestant.

(2) *1,000,000 Francs.*—This sum is to be apportioned among the *French contestants who have flown over the entire course.*

The contestant who thus finishes first *among the French entries* will receive a prize of 500,000 francs, provided his average speed has been 325 km./hr. (202 m./hr.) or better. If his average speed has been between 280 km./hr. (174 m./hr.) and 325 km./hr. he will receive a prize of 300,000 francs.

The contestant who finishes *second among the list of French entries* will receive a prize of 300,000 francs if his average speed (over the entire course) has attained 325 km./hr. (202 m./hr.) or better. He will receive 200,000 francs if his average speed has been between 325 and 280 km./hr.

The contestant finishing *third among the list of French entries* will receive a prize of 200,000 francs if his average speed over the entire course has attained 325 km./hr. or better, and 150,000 francs if his average speed has been between 325 and 280 km./hr.

(3) *1,000,000 Francs.*—A prize of 1,000,000 francs will be awarded to the French contestant *who finishes first among the International List of Entries* and whose average speed has been better than 350 km./hr. (217 m./hr.). If his average speed has been only better than 320 km./hr. (198 m./hr.), he will receive 750,000 francs.

If this French contestant finishes *second in the International List of Entries,* he will receive 750,000 francs, provided his average speed has been better than 350 km./hr., and 500,000 francs if it has been only better than 320 km./hr.

If this contestant is classed third in the International List of Entries, he will receive 500,000 francs if his average speed has been better than 350 km./hr., and 250,000 francs if it has been only better than 320 km./hr.

The entries for the Deutsch de la Meurthe Cup are as follow:—

Entry	Plane	Engine
René Caudron	Caudron	Renault.
Farman Aeroplane Co.	Farman	Farman.
Henry Rabattel	Farman	Hispano-Suiza.
Regnier	Caudron	Regnier.
Bechereau-Kellner	Bechereau-Kellner	Delage.
Henry Potez Aeroplane Co.	Potez	Potez.
" " "	"	"
Luodovic Arrachart	Caudron	Renault.
Farman Aeroplane Co.	Farman	Renault.
Albert Aeronautique	Albert	Regnier.
"	"	"
George Aversing	Comper Swift	de Havilland.
René Caudron	Caudron	Francois Baudot.

FROM THE CLUBS

LONDON AEROPLANE CLUB

The Club is pleased to have Maj. Travers back after his attack of influenza. On Saturday night several members were present at the Hanworth debate, and on Sunday Mr. and Mrs. Mollison, flying their respective machines, arrived and departed *en route* for the "Great Adventure." Mr. Michael Beary, the well-known jockey, has joined the Club as a flying member.

HANWORTH (N.F.S.)

Three new members joined the Club during the week and commenced immediate instruction for pilots' "A" licences. Lt. Com. R. H. S. Roundell, R.N. (Rtd.), of the R.N. Flying Club, on Saturday carried out the whole of the 3 hr. solo flying required for his licence. The weather at the commencement of the week somewhat restricted flying, but several members carried cut cross-country flights, including Messrs. D. Llewellyn and Farquharson. On Saturday, February 18, a masked ball is to be held at the Club.

GREATER FACILITIES AT BROOKLANDS

Membership to Brooklands Flying Club will now carry with it membership of both the Cinque Ports and Northampton Flying Clubs, all for the one entrance fee. This will mean that pilots using their machines at Brooklands will now be able to visit the other clubs and use the facilities provided, without extra charge. Flying tuition will be given at both these clubs at the same rates, of £2 to 30s. an hr. on a graduated basis for standard instruction, £2 10s. per hr. for advanced dual, and £3 per hr. for blind flying and instructors' courses, which it must be admitted are extremely low. The aircraft are, of course, up-to-date in all respects, and Gregory Quilter parachutes are being fitted to all the school machines. The Reid & Sigrist blind-flying instruments are used in the machines allocated for that particular type of instruction, and, for those who would go further, there are machines fully equipped for night flying, so that "B" licences may be obtained. There is nothing at all which the embryo pilot or ground engineer cannot obtain in the way of training at Brooklands or in the Aeronautical College of Engineering, with which it is associated.

Brooklands Aerodrome has been very busy during the past week in spite of the foggy weather; one day was completely "washed out," but one or two others were so bright that they simply invited flying; the lengthening days have also increased the number of potential flying hours. Several machines have lately made emergency landings, being caught by approaching darkness on cross-country flights; two were not equipped for night flying and so stayed the night. Mr. and Mrs. Mollison arrived on Sunday and did a little flying in one of Brooklands' machines. Mr. Chizik has done the 3 hr. solo and height tests necessary for his "A" licence. Great strides have been made with the emergency signal which is now nearly completed and will be tested shortly.

MAIDSTONE AERO CLUB

The Maidstone Aero Club held their monthly "At Home" on Sunday, February 5, to welcome the new Captain, Mr. C. H. Lowe-Wylde, and the Vice-Captain, Mr. M. Sassoon. Mr. Lowe-Wylde has always been a great supporter of the Club's activities, and members took the opportunity of wishing him every success with his new "Baby" machines which are producing such widespread interest in aviation circles. Mr. M. Sassoon, the Vice-Captain, is one of the earliest members of the Club, having joined before the new management took over and developed Maidstone Airport. On Sunday, February 12, the Club are holding their monthly Clay Pigeon Shoot, and on Friday, March 3, the annual spring dance will be held at the clubhouse at 8.30 p.m.; tickets are 5s. 6d. each, which includes supper.

SURREY AERO CLUB

A high standard of flying has been maintained during the week at Gatwick. Mr. D. Brown, a pupil at the London School of Flying, who is taking a comprehensive course in aeronautical engineering, and a "B" licence, went solo on Thursday. Miss D. Reynolds has resumed dual instruction after her accident hunting, and Mr. S. H. Holland, who has recently returned from Brazil and is living in the neighbourhood, has decided to house his machine at Gatwick.

About thirty trees have been cleared from the south-east corner of the aerodrome, and about a hundred tons of rubble are being put down near the entrance to the aerodrome, the road being taken right up to the hangars and to the petrol pumps.

THE HAMPSHIRE AEROPLANE CLUB

The flying for January totalled 72 hr. 50 min., which is an increase of 10 hr. on January, 1932. Great keenness has been shown by members who have turned up on every day that the weather permitted. During the month four new members joined the club and are learning to fly. Mr. E. T. Moscham successfully passed his tests for an "A" licence, and Miss Wilmer made her first solo flight. During last week another slotted "Gipsy Moth" has been added to the club's aircraft. On January 25 a dance was held at the Pavilion, Bournemouth, which was attended by 400 people; to advertise this dance a formation of club machines flew over Bournemouth on the previous Saturday with a full paying load of passengers.

THE CINQUE PORTS FLYING CLUB

Two days during the week were completely impossible for flying. Visitors included a twin-engine Sikorsky from the Continent, Mr. James in his "Stinson," and two Hawker "Furies," which landed owing to fog. Another visitor was Senor Fernando Kein Loving, in a Comper "Swift," who landed with a petrol leak, which was promptly put right. He proposes to break the record from Spain to the Phillipines, and was on his way to the starting point.

LEICESTERSHIRE AERO CLUB

Fog, rain, and snow reduced the flying hours for January to 43¼, while during the cold weather skating proved a powerful counter-attraction. The "Puss Moth" was the most popular machine during the cold period. During the month Dr. C. K. Millard, who is 63 years of age, and Medical Officer of Health for the City of Leicester,

INSTRUCTION AT FORD AERODROME: Mr. T. Nash (left), the Chief Instructor of the Sussex Aero Club, with Mr. Gurbax Singh Chowdery, who is training as 2nd pilot for the Maharajah of Patiala. The Maharajah has purchased a "Monospar" (two Pobjoys) which is now being flown out to him by Capt. A. F. Muir and Mr. Man Mohan Singh.

made his first solo flight. On January 26 Flt. Lt. G. N. P. Stringer, the chief instructor, delivered a lecture on "Practical Points and Common Errors in Flying," which was well attended. The next lecture will be on Thursday, February 9, given by Com. T. W. Woodriffe, R.N., on the subject "Seaplanes and the Battle of Jutland."

On Tuesday, January 31, the Leicester City Council very wisely decided to carry on with the construction of the Municipal Aerodrome at Braunstone, which will bring the aerodrome within 3 miles of the centre of the city of Leicester.

In view of the current economic conditions it has been decided not to hold the annual club ball this year, but instead the club will have a dance at the Palais-de-Danse, Leicester, on Friday, March 3, and any visitors by air will be welcomed. The tickets are 5s. each.

THE NORTHAMPTON AERO CLUB (SYWELL)

The Club has not yet seriously begun its flying activities for the season, though a number of new members have been enrolled, and more keep coming in. On Saturday and Sunday, which were both excellent flying days, the private owners who garage their machines at the aerodrome all turned up at once and flew round. The opening party on February 11 is going to be a dance, starting at 8 p.m., with a running buffet and an excellent band. The price of tickets is 5s. each and can be obtained from the Secretary.

HULL AERO CLUB (N.F.S.)

Two lectures will be given this week which should be of considerable interest. To-day, February 9, Flt. Lt. C. F. Uwins will lecture on "The Altitude Record," and on Thursday, February 23, Lt. Com. the Hon. J. M. Kenworthy, R.N., will lecture on "The Limitation of Armaments and Civil Aviation." Both these lectures will commence at 8 p.m. Club dances will be held on Saturday, February 11, and on Saturday, February 25.

YORKSHIRE AEROPLANE CLUB

The record of the Yorkshire Club has been one of continued progress; the membership now numbers nearly 200, and is steadily increasing. During 1932 the Club machines, which consist of four D.H. "Moths" and two Desoutters, flew 1,337 hr., an increase of 150 hr. on the total for 1931, and given reasonable weather, the flying hours for 1933 should show a further increase. The new aerodrome at Yeadon, which is ideally situated for the convenience of the large population in the Leeds-Bradford area, has now been thoroughly drained and levelled, £2,000 having been spent on its improvement. Lord Grimthorpe, himself a private owner, is President of the Club and does a considerable amount of flying. Of the ten private owners, eight house their machines at Yeadon; one, Mr. J. L. Macalpine, owns an "Autogiro," and was the second private owner to do so. The newest venture is the formation of the Leeds University Flying Club under the able secretaryship of Mr. V. R. Patankar.

A new dance hall has just been erected on a site adjoining the club-house, and will be opened shortly. The Annual Ball, held on December 2 at the Hotel Majestic, Harrogate, easily surpassed its predecessors. Among other events of a social nature have been bridge drives, at homes, dinners, lectures, a tour of inspection of a large aircraft factory, a visit to the R.A.F. Display, and free flight schemes run in conjunction with local business houses.

The biggest pageant of the year was held on June 18, when Sir Alan Cobham visited Yeadon in connection with National Aviation Day. Another interesting event was the Hart Trophy Inter-Landing Competition held on July 2; seven machines flew over from Woodford, Cheshire, and the competition was won by the Lancashire Club. On Sunday, August 14, Maj. von Schleich and Capt. von Richthofen visited the Club, gave flying demonstrations and broadcasted to the crowd. Flt. Lt. Comper also led exhibitions of formation flying. On Saturday, September 10, an Air Race took place from Yeadon to Newton House Hotel aerodrome, the winning pilot being Mrs. J. L. Macalpine.

THE LIVERPOOL AND DISTRICT AERO CLUB

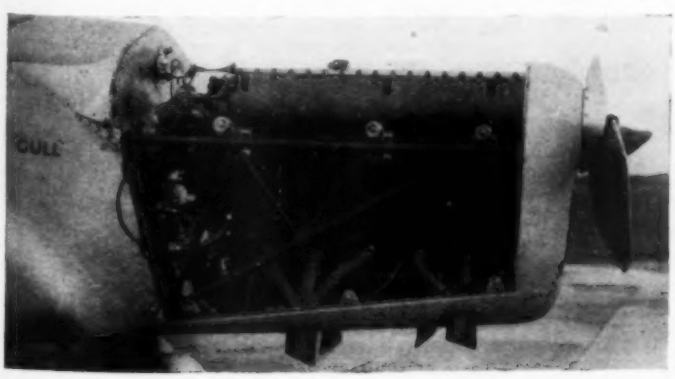
The Liverpool and District Aero Club have made steady progress during the year 1932, the number of hours flown being 2,379, which is an increase on the previous year. The Club membership stands at 289, of which 147 are flying members. The Club has two pilot instructors and an equipment of six machines, all engine repairs and Certificates of Airworthiness renewals being carried out by the Club's ground staff. On the financial side, the expenses of the Club per flying hour have decreased, and for the half-year ending August 31, 1932, the cost per hour in respect of crashes amounted to only 1.22s.

The arrival of night-flying equipment sees Liverpool embarking on yet another stage of Club history. It is the aim to become the foremost Club in the country in regard to both hours flown and comprehensiveness of instruction. It now only requires members to avail themselves of this instructive side of flying to make it a "raging success." On January 29 seven machines made the journey to Woodford, and those forming the party spent a very enjoyable afternoon and appreciated the hospitality extended. It is hoped to plan similar trips to several "air neighbours" in the near future.

Income hours flown—which is the most material factor to consider in this respect—for the month of January, 1933, were 142, against 109 in 1932. First soloists during the month—3. One of these had his first flight in an aeroplane on a Monday, joined the Club on the Tuesday, first solo on the Friday!

LONDON GLIDING CLUB

On Saturday, February 4, a vicious wind blew from the south-west obliquely to the ridge. The "Kassel 20" soared for 20 min., being thrown about with unusual violence, and the Prüfling was flown down to the bottom of the hill twice. On Sunday the "Kassel" two-seater carried passengers 11 times, the machine being almost stationary at 50 m.p.h. in the morning, and 43 m.p.h. towards the end of the day so strong was the wind; she made eight landings on the hill top. The "Crested Wren" flew for 22 min., the "Kassel 20" was soared three times (the longest trip being 45 min.), and the Prüfling was soared once and glided down three times. The wind was the strongest in which the Club has ever soared freely, the turbulence being very well marked as well as its strength. Great credit is due to the pilot who consented to give flights to passengers ten times in rapid succession. On the whole flying has been extremely unpleasant, although very educative.



THE NEW NAPIER ENGINE: The Napier 6-cylinder in line air cooled engine has now been installed in the Percival "Gull," and has resulted in putting the top speed of that machine up to approximately 165 m.p.h. At cruising throttle opening the "Gull" does no less than 142 m.p.h. while carrying pilot, two passengers and fuel for about 550 miles. In this connection it might be mentioned that the original power estimate of 150 b.h.p. for the Napier engine was conservative, and that the engine now gives very considerably more power.

VENTILATING GRIEVANCES

A Debate at one of our prominent Flying Clubs on the Question of Getting a Better Aircraft for Private Owners

HANWORTH Club's debate, held at Hanworth Park on Saturday, February 4, was hardly a success as a debate, as the motion was not in a sufficiently concrete form. It was, however, at least an opportunity, taken very readily by many members and guests, of airing their views as to the way in which the lot of the private owner could be assisted by alterations to the legislation of the Air Ministry and the A.I.D. The motion, as announced, was that "A more suitable, practical and economical type of aircraft for the private owner is overdue."

The Debate

FLT. LT. R. E. ALLEN was in the chair and opened the debate, introducing the speakers.

MR. E. C. GORDON ENGLAND expressed the view that we were fortunate in having an excellent Air Ministry, with a wonderful set of officials. He thought that we should have fared far worse if they had not been such keen enthusiasts. During the 13 years they had controlled civil aviation, 5,000 pilots had been taught, and of them 411 were private owners. £2,000,000 had been spent on facilities, conveniences and regulations for civilian people, so that it was suggested that each private owner was subsidised to the extent of £5,000. (What about the flying clubs and taxi concerns using these facilities?—ED.) Mr. Gordon England thought that before long the taxpayers and unemployed would ask difficult questions about this position. He thought that Great Britain had been responsible for the regulations in the first place, and that we had led other countries into following suit. He suggested that the owners' rights at common law had been removed by the regulations, and that the manufacturers were exonerated from all responsibility. He referred to the military mind as holding back civil aviation to-day. Comparing the private owners of to-day with the owners of sports cars, he said that the real private owner had not yet arrived. What this man would want would be a comfortable, carefree aircraft, with no swinging of propellers, a self-starter, and an aeroplane which could carry on by itself. Moreover, it must be one out of which it was possible to see. In conclusion, he felt that only two things were needed out of all the present regulations to make this practicable: (*a*) Registration for the purpose of identification, (*b*) compulsory third-party insurance.

MR. MARCEL DESOUTTER thought that the manufacturers were stressing speed too much and providing private machines for the type of person who owns a sports car. He felt that the existing aircraft were too difficult to fly for the "man in the street" to take to, and that there were hundreds of people who would like to fly out and home again at the same speed average as they travelled in a car. He ridiculed three-point landings and upheld the view that the correct way was to fly on to the ground and then stamp on the brakes, three wheels or two wheels and a skid being fitted for the purpose. Aerobatics he considered as having done a great deal of harm, and thought the machine with a slow landing speed was the type that was wanted.

FLT. LT. W. E. P. JOHNSTON advocated the retention of legislation as being the means of attaining the suitable aircraft. He said that Mr. Gordon England's argument about common law rights was a specious one, as they had been removed in 1884 from employers and mine owners who used to work children 12 and 14 hours a day.

MR. R. PRESTON gave some information about the Annual Air Races held in America, and thought that the holding of something similar in this country would, if a large prize money fund were established, result in an incentive to build private aircraft.

MR. ARTHUR CARPMAEL felt that the "Autogiro" had been overlooked, and suggested this as the answer to the motion.

LT. COM. COLSON, R.N., did not think that private ownership was going to be a really big thing in this country. He suggested that the analogy drawn with motor-cars was wrong, and thought that it was impossible to have the "man in the street" taking to the air in large numbers until he could do so at any time of the day or night in any weather. He thought a better comparison was that of shipping, with private aircraft compared to yachts. He did not think that you could possibly tie down one type as being the ideal private owners' aircraft. He did not agree with control being taken away from the Air Ministry, particularly if third-party insurance was made compulsory, as the insurance companies would insist on some other body, such as Lloyd's, controlling the airworthiness of machines, and the result would be just as expensive if not more so than at present. He concluded by expressing the opinion that what was wanted was simplification of the existing Air Ministry and A.I.D. regulations.

MR. N. H. WHITESIDE, M.P., believed that it was time a cheaper aircraft was placed on the market, and thought that the demand was low owing to the "man in the street" being afraid of the air on account of dangers which were not real, but which were made to seem so by people who stunted low and who flew through impossible weather. He suggested that all regulations should be removed from the Air Ministry and undertaken by the insurance world. He felt that everyone had a "Moth" complex, and that the manufacturers were wrong in waiting for a demand before they created a machine. He asked for a pusher machine and therefore congratulated Mr. Lowe-Wylde on his efforts. He also asked for side-by-side seating.

MR. MARCUS MANTON stressed the need for an adequate range of vision and also asked for greater simplicity.

MR. LEE MURRAY admitted having a great knowledge of legislation, as he came from that free and democratic country, Australia! He also admitted having received help from Farnborough in the construction of a somewhat original aeroplane upon which he was engaged. He thought it a very bad thing indeed that it was necessary for constructors to write for permission to fly their aircraft, and felt that the process by which every modification suggested had to be submitted to Farnborough could only result in compromises being made, to the detriment of the aircraft. He felt that the Air Ministry should not require a machine to have a certificate of airworthiness while it was still in the manufacturers' hands. This would result in the production of cheaper aircraft.

MAJ. H. G. TRAVERS asked that motions should be put to the meeting and that the result should be transmitted to the Air Ministry. He felt that restrictions should be removed from the building of experimental aircraft.

COL. THE MASTER OF SEMPILL, speaking in favour of the motion, felt that the market for existing light aircraft was saturated. He thought that the aim should be to build a machine at half the present cost, which was very much easier to fly than those at present used. One with a pusher airscrew, a dead slow landing, with a top speed of 75 m.p.h., with two passengers, the running costs lowered by some 60 per cent., and a petrol consumption of 45 m.p.g. He thought it an unnecessary regulation that a single individual, without any danger whatever to anyone else, might not build and fly a machine without permission, and so break his neck if he chose. The Master of Sempill also read a message from Mr. Grahame White expressing his heartiest support of the subject, and from Sir Alliot V. Roe suggesting that to be really useful, aircraft should be capable of rising from and alighting on a tennis court. They should be able to land dead slow with the engine running, or like the "Autogiro" with the engine stopped; they should look like the "Autogiro" without a propeller, the engine being coupled to the rotor.

LT. CATHCART JONES, R.M., thought that the constructors were making their machines for the Air Ministry and not for the private owner. Moreover, the results were meddled with at Martlesham and fiddled with at Farnborough. He voiced a plea for speed as being the only thing that the air had to offer and thought that the less time you were in the air the more economical it was. As

(*Concluded on page* 138)

AIR TRANSPORT

THE AEROPLANE PASSENGER

By W. G. RAFFÉ

(*Concluded from page* 109)

THE problems of insurance are important, especially in relation to the total passenger fare. Normally, every fare-paying passenger is automatically insured, for varying sums according to the company's country, in sterling, marks, or francs, etc. But this device, first adopted because ordinary insurance companies did not handle the risks, is no longer applicable. Many ordinary insurance companies either cover their policy-holders' risks with a special aviation clause, or alternatively they will grant an extension of coverage on application and payment of a small extra premium. The safety of aircraft is now known to be so definite that it is safer to be in the air than walking across Piccadilly Circus at the mercy of motorists on skidding surfaces.

The question then arises, whether it is not better to offer each passenger the option of buying an "insurance-inclusive" ticket, or an "insurance-excluded" ticket at a lower price. This would allow a definite and doubtless greatly appreciated reduction in the normal fare. For example, on the Deutsche Luft Hansa airlines, the proportion said to be paid over to the insurance company is 10 per cent. of the total fare. On the Czechoslovak lines this rises to 12½ per cent., while on the French Cidna line no less than 16½ per cent. is said to be allotted to the payment of insurance premium.

There are many passengers to whom their life insurance is of no practical consequence, especially bachelors, or others sufficiently well off to make it unnecessary, relative to the short period of risk, and being well enough covered by other annual policies.

But when a passenger *has* paid for this insurance, it can be no pleasure for him to find that the conditions are so stringent that he derives no benefit from them. They cover only serious personal injuries, or loss of luggage. *The most likely loss, that of time, is entirely neglected.* When a business man loses several hours, perhaps a day or more, consequent upon a forced landing (and suffers no personal injury or loss) he comments on this farcical "insurance" which he is *compelled* to buy dearly in his fare, do not add to the attractions of air travel. In short, air transport insurance conditions require to be severely overhauled and brought into touch with modern conditions and the expressed need of travellers. Many a man would much rather insure his time than his life; for he will himself recover his time loss, while his life loss is of no further interest to him in terms of money value.

Besides actual transport, catering problems assume an importance in proportion to the absence, relative or absolute, of other facilities. For journeys of only an hour or two the need of food is no more exacting than it is at a theatre. But, as with amusement, some people need to eat whenever they travel. Otherwise, they feel, they scarcely enjoy life.

The traveller new to the air deserves a word or two of warning, exactly as those fresh to other transport. A word in due season on the ocean—even a cross-Channel packet—may avoid an hour or two of misery. The smaller the boat, and the rougher the weather, the more the need for words of caution. Much the same applies to aeroplane travel. For fine-weather trips in our latest luxurious four-motored machines, even the most queasy stomach may rest in peace. But when flying in gusty weather in a three-seater lightweight machine, even an experienced traveller may well be careful concerning food. Even on ocean-going ships sometimes the weather is rough enough to disturb the crew. Many people will do anything to avoid sea going because of the extreme discomfort which a bout of seasickness causes them. *They need to be told how far superior is the average aeroplane crossing;* but they need also a hint or two on how to avoid even the slightest trouble. Certainly they should not be encouraged to unwise eating or drinking while on board, or just before the start.

Sometimes aerodrome restaurant service is good. Sometimes it is lacking. The Schiphol restaurant at Amsterdam is now very well known to air travellers, though barely two years old in its new form. Its services in several languages are almost invariably good, though the difficulties of currencies seem to be solved more rapidly than those of language or prices. In fact, one is inclined to demand far more attention to giving full and accurate information in four or five languages; while a daily placard on exchange rates is quite essential in all aerodrome restaurants, as well as all European times on a set of clocks.

Prompt and adequate catering service is now developing into a twenty-four-hour day necessity. With aeroplanes arriving from all parts of Europe at almost any hour, hot food are bare essentials to existence. Sometimes bad breaks may be seen, as, for example, one day last August one passenger was heard at Tempelhof loudly complaining that he could get no attention, even for a cup of tea, at 1.0 p.m. midday!

It will be as well if close attention is paid to these services, especially to avoid obtaining for restaurants in aerodromes the same unenviable reputation which railway station restaurants seem to have secured.

When time-tables come to be revised, one or two items need consideration. Starting times based on original mail services need revision when passenger services are organised. Air passenger travel is not going to be made successful by dragging people out of their beds at unearthly hours of early dawn so that they can travel on the same machine which carries mails. Especially when, as happened recently to the writer, a 7.0 a.m. start from the aerodrome was interrupted at 8.0 a.m. by a forced landing in the wilds of Austria, causing a delay of 30 hr. in reaching Bratislava from Zagreb, instead of a 2-hr. journey—*and no recompense by insurance for the lost time!*

Some of the Russian services start at such times as 4.0 a.m., which hardly seems necessary when the flight is concluded at midday the following day. One wonders, why not start at a more reasonable hour and divide the flight into two normal days instead of one abnormal day and a-half day? Certainly, neither pilot nor passenger can feel very fit until a good sleep provides some rest, following on this early rising and the long journey. Air companies can hardly expect fare-paying passengers to enter for endurance records.

The timing of the Deruluft midnight service, Berlin-Königsberg-Moscow, is open to this comment. It leaves Tempelhof at 23.30, stops in Königsberg from 3 to 4, and arrives in Moscow by 10, Russian time. As the English traveller arrives from London at 16.20, he already has a long wait. He could just as well proceed six hours sooner or six hours later; or he might like to leave Croydon an hour or two later, to begin with.

A further useful item would be to indicate on the new maps of Europe, with their amazing straight lines from city to city, the usual "through routes" more clearly. At present they can be found only by prolonged study or by actual experience.

Air travel will be increased by a better "free luggage allowance." The present limit of 15 kilos, about 33 lb., is much too small. It should be at least 25 kilos, which might speedily encourage more ladies to travel. The internal limit of 10 kilos within Germany is ridiculously small, especially when it is precisely the same luggage allowed to the same passenger who has entered the Republic from another country. If 30 kilos can be allowed between Berlin and Moscow or Leningrad, why not elsewhere? And the attempt, made by one employee in the Prague Cidna office, to include the small leather case of private papers (not much bigger than a pocket book!) in weighed luggage was another absurdity. For it suggested that a few extra ounces might endanger the stability of the Cidna machines, which is hardly the fact.

THE AMSTERDAM—BATAVIA WEEKLY SERVICE

By A. PLESMAN

Mr. Plesman is managing director of the Royal Dutch Air Lines, better known under the initials K.L.M. On February 2 he delivered a lecture before the Royal Aeronautical Society, of which the following is an abridged version. Mr. C. R. Fairey was in the chair. In introducing the lecturer, he pointed out that Mr. Plesman had come over to England to give the Society an account of a piece of solid achievement and successful pioneering.

A REGULAR air service between Amsterdam and Batavia has now been in existence for more than two years, a fact which today is generally known. The great and mutual interests which bind Netherland with its colonies—interests of a cultural, commercial and also of a governmental nature—have always placed in the foreground the necessity of bridging over as rapidly as possible the enormous distance separating both territories. Two shipping companies, the Netherland Royal Mail Lines and the Rotterdam Lloyd, provided for transport by sea, and spared no labour, expense or trouble to render this means of communication as rapid, regular and comfortable as possible. Telegraphy naturally also made a rapid exchange of thought possible, and this telegraphy was still further improved during the war through the institution of a wireless telegraphic service; whilst, since 1930, wireless telephonic communication is possible from the Netherlands with the principal towns of Java and North Sumatra. It is understandable, therefore, that in the same way the idea developed of establishing an air service between Amsterdam and Batavia.

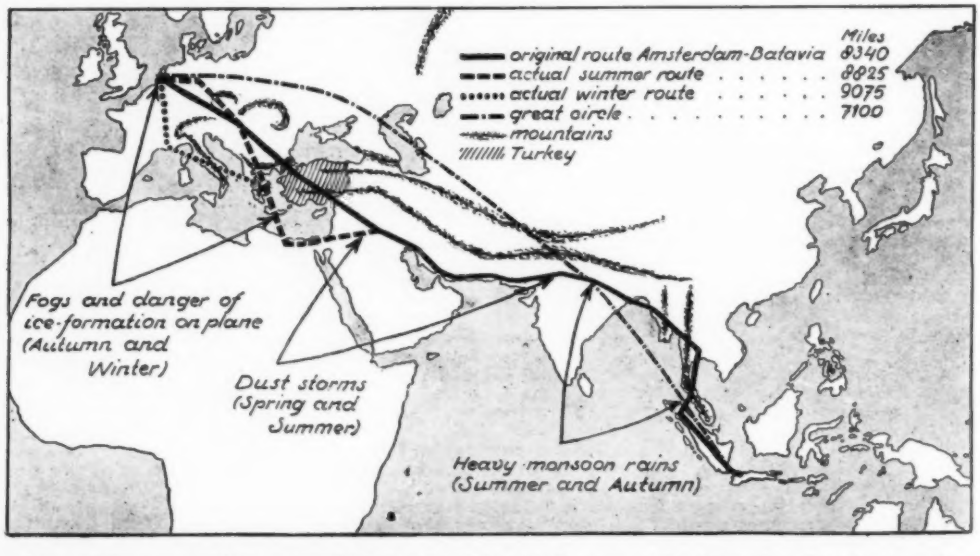
Before a beginning was made with regular operation, various test flights were carried out. On October 1, 1924, the K.L.M. pilot, Van der Hoop, started from Amsterdam, supported in his enterprise by the Committee "Flight Holland-India" and by the Netherlands Postal Department. It was the successful flight of this pioneer, carried out in extremely difficult circumstances, and also his most convincingly written book, which opened the eyes of the public in Holland to the possibilities of an air service to India. Three years, however, were to pass before the next attempt was made—an attempt which was due to the fact that the American Mr. Van Lear Black, who had already made several special flights with the K.L.M., expressed the wish to undertake a flight to Netherlands India. Notwithstanding the scanty preparations and the fact that neither the engine nor the machine were constructed to fly through the monsoon rains which swept a considerable section of the route, whilst further there was even no opportunity along the route of filling up with fuel of the desired composition, this flight, thanks to the excellent abilities of the crew (Messrs. Geysendorffer, Scholte and Weber), was successfully carried out. The flight out was performed in 13 days, and the return flight in 14. Shortly afterwards a new flight was carried out under command of Koppen, with the support of the above-mentioned Committee, the first flight with a triple-engined Fokker machine, the *Post Dove*. This flight was performed in the excellent time of nine days out and ten days home. In the meantime, the Royal Netherlands Indian Airways had been founded in India, and an opportunity was offered in 1928 of flying out to India the machines destined for that company.

On the occasion of these first test flights, very praiseworthy support and co-operation were given by the Netherlands Postal Department. The management of this institution did not adopt the standpoint that an air service between Amsterdam and Batavia should first have materialised before it was granted facilities for carrying mail, but realised from the very beginning that this air service, if it was to be established, should be able to reckon on the greatest possible co-operation of the Postal Department. In the most broad-minded spirit, therefore, even the first test flights in 1928, and those which followed in 1929, were granted every facility for the carriage of mail, and its transport was adequately paid for. That a regular service has been established is due, therefore, in the first place, to the support and the far-seeing spirit of the Dutch Postmaster-General.

When this method of transport was in course of preparation, the K.L.M. had no lack of good counsellors. There were those who pointed out that the route Amsterdam-Batavia was for a considerable part a sea route, and ought, thus, to be run with seaplanes. There were others who argued that the route ought to be sub-divided into various parts and flown on the estafette system. There are many today who criticise the fact that the cargo carried is miscellaneous instead of being restricted to mail.

These are a few of the problems. When one takes in hand, however, the operation of an air service like that of Amsterdam-Batavia, the following problems present themselves in mutual relation:—The choice of material. The choice of route. The choice of cargo. Personnel. The method of operation (estafette system, through traffic).

With those problems in view, we have arrived at the present form of exploitation—a form which presents various sides which require further elucidation.



Some of the geographical, meteorological and political hindrances on the Amsterdam–Batavia air route.

Choice of Material

In the first place there was the problem: land or seaplane. This question was decided in favour of the former, because the view was held that a real seaplane, able to resist a heavy sea, had yet to be constructed, whilst the seaplane as regards acquisition and upkeep is far from economic in operation. Further, the adoption of a sea route would have necessitated either a considerable detour or long flights with seaplanes over the mainland. Another solution, of course, would have been to employ various types of machines, *i.e.*, both sea and land machines, or else amphibian craft. For various reasons, however, which will be referred to later, the K.L.M. does not favour operating the service with various types of aircraft. Moreover, the shortest route leads for the most part over land and for that reason the choice of the aeroplane was from the very beginning regarded as self-evident. A first requirement for the machines on the Indian route is that a possible defect in one of the engines need not directly necessitate a forced landing. This means that a multi-engined machine shall be able to fly at a fairly safe altitude and remain under control, even when one of the engines has stopped. A machine equipped with three engines has up to the present been the choice of the K.L.M. and the results have been excellent. It is very improbable that a second engine would stop at the same time. Flying with two engines and with a machine fully loaded must be possible under the most unfavourable circumstances. The machines successively placed on the Indian route by the K.L.M. answer these requirements, and where experience has proved that during 20,000 hr. of operation no forced landing outside an aerodrome owing to engine trouble took place, one can risk flying with an aeroplane across the Mediterranean or over the jungles of Burmah and Sumatra. Later, we shall give a further description of the material now in use.

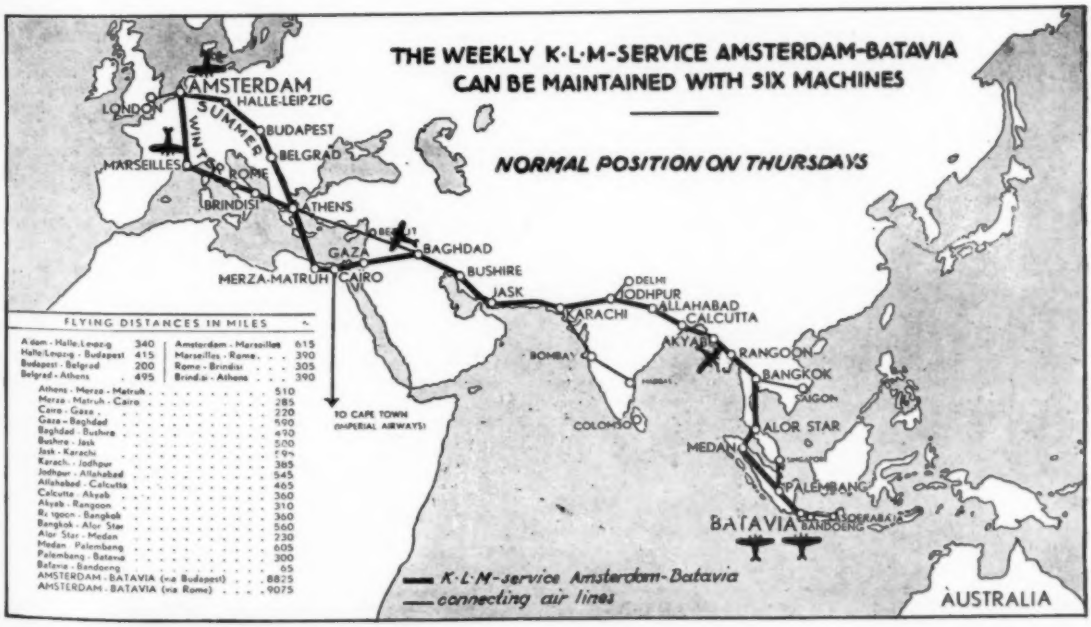
Choice of Route

Once the decision was taken to operate the service with aeroplanes, a number of other—often conflicting—considerations presented themselves. As starting point of these considerations, the shortest line of communication between Amsterdam and Batavia—the great circle—had only value as a standard of comparison. This shortest route is 11,360 km. (7,100 miles) long, and runs from Amsterdam, via Berlin, over Astrakan, through Turkestan, transversely over the Himalayas, skirts Delhi and the Andaman Islands, passes almost over Medan, to Batavia.

Many reasons make deviation from this shortest route desirable, even if it is not impossible, in theory, to follow it. The chief objection to do so are the following:—The nature of the country, in a vertical sense; weather conditions; considerations of traffic economy; political difficulties; whilst apart from all this, the choice of route is finally determined by a fifth factor: The *ground organisation* already existing or practically possible.

With regard to the vertical nature of the country flown over, it may be said, generally speaking, that flying over low areas (plains or sea) guarantees greater safety and regularity than flying over hilly or mountainous country. Although technical difficulties no longer prevent aeroplanes from reaching even a very great height (the altitude record is actually about 44,000 ft.), flying over mountains is extremely undesirable for an air traffic company. In the first place the loading capacity is very unfavourably influenced when flying at great heights, especially when one must adhere to the principle that a triple-engined machine may not be forced to land by the stopping of one engine. For these reasons, mountainous regions like the Himalayas or the Pamir plateau still constitute insuperable difficulties for air traffic. Perhaps the stratosphere aeroplane will eliminate this impediment later on. Further, low hanging clouds in mountainous or hilly country will render navigation more onerous or flying more difficult owing to ice forming on the aeroplane than when flying over low country.

This connection between weather conditions and choice of route can best be explained by an example. At the end of 1930, the European section of the Indian route ran from Amsterdam, via Budapest to Athens. During the winter of 1930-31, the regularity attained on this section proved insufficient. As matters stand at present in the technique of aviation, Central Europe and the Balkans are less suitable for air traffic in the winter months owing to snowfall, the chance of formation of ice on the machine, low-lying clouds and bad visibility. As a result of the experience gained the following system was adopted during the winter 1931-32:—On the basis of the forecast of the Royal Dutch Meteorological Institute, a decision was taken for each flight separately whether the machine would proceed via Central Europe or via Marseilles and Rome to Athens. For the outward journey this was decided in concert with the pilot at Amsterdam. For the journey home, the pilot received telegraphic advice at Athens. The route via Marseilles and Rome was prepared in good time, whilst along both stages the arrangements made were so that a few telegrams were sufficient to inform all concerned which way the machine would come.



THE AMSTERDAM-BATAVIA AIR ROUTE: By letting each machine with its crew go through from terminus to terminus, the weekly service in each direction can be maintained with but six machines.

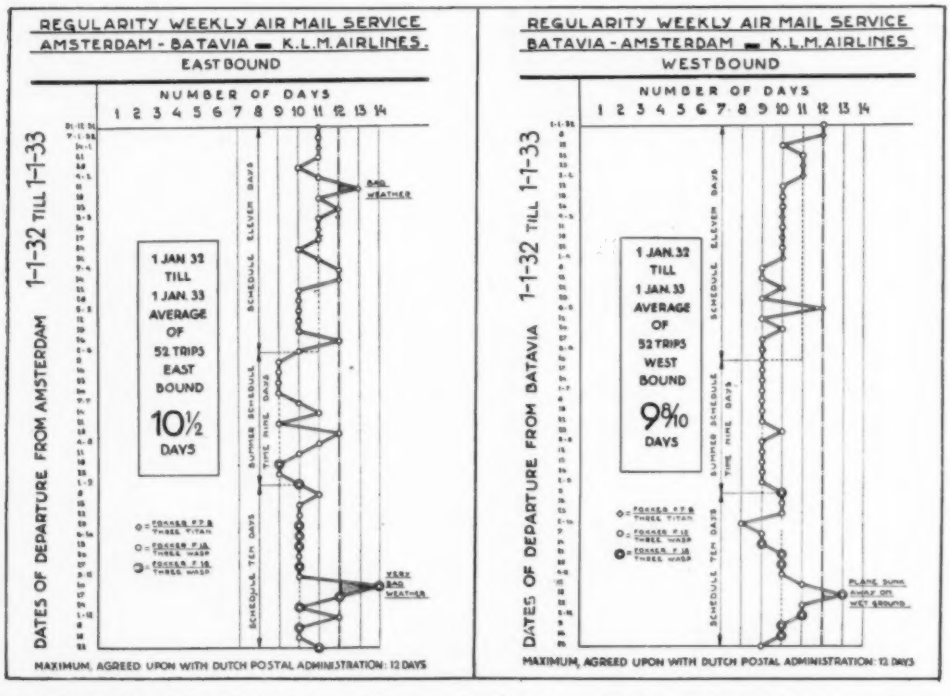
Although the southerly route was about 300 miles longer, the experience gained during the winter of 1931-32 was so positive as regards safety and regularity, that for the winter and spring period of 1932-33, this winter route was adopted permanently. At present, from November 1 till the end of April, the flights take place via Marseilles and Rome; in the other six months via Budapest.

Considering the economic importance of the choice of route, then it is clear that it is more desirable to have intermediate landings at great commercial and traffic centres than at stopping places arbitrarily chosen. As long as the freight carried does not fill the machine from starting point to final destination, it is of importance to increase the receipts by the transport of mail, passengers and goods. Moreover, in this way, one renders the countries concerned the service of linking them up in world air traffic and achieves the result that the interests of the countries over which the air route passes coincide with those of the transport company. In this respect, landing places like Halle—Leipzig, Budapest (in winter Marseilles and Rome), Athens, Cairo, Baghdad, Karachi, Calcutta, Rangoon and Bangkok, all of which are touched by the air line Amsterdam-Batavia, are very favourable. It is all the more remarkable that few of these countries show any desire to make use of the enormous advantages in the sphere of rapid communication which the K.L.M. line offers. At Rome passengers are not permitted to land or embark, whilst it is also forbidden to load or unload goods. British India also only wishes to send mail on a very restricted scale with K.L.M. machines, in spite of the fact that the business world in that country, once it had learned thoroughly the advantages of the communication afforded by the K.L.M., through the mail *received*, has called for it for years.

LOADING THE MAILS: An early-morning scene at Schiphol, the Amsterdam aerodrome. The K.L.M. has undertaken to carry up to 500 kg. (1,100 lb.) of mails on each trip.

And here we approach one of the most remarkable obstacles threatening international air traffic—the political factor. This political factor seems to be the worst enemy of air traffic. One frequently hears it asserted that air traffic, knowing no frontiers, will contribute to affect closer co-operation and a better mutual appreciation among the nations. Few suspect, however, to what an extent air communications are still all too frequently a source of political obstruction and wrangling. Let us hope that the political factor in air traffic is on its last legs, but that it does not kick out too vigorously in its death struggle.

During the early development of the air communication between Holland and its colonies in the East, everyone feared the technical difficulties, and although the final goal has not yet been reached, it appeared that technique and science—to a greater extent than was expected—were able satisfactorily to answer all requirements. But the difficulties in the political sphere, the source of so much unnecessary waste of energy, were greater than the technical difficulties will ever prove to be. We will not go into details, but restrict ourselves to one example, but one which throws everything into the shade as an example of short-sighted air traffic policy—that of Turkey. This country seems to see its national salvation in hermetically closing itself to all modern means of communication. Unfortunately this country lies on the route which the K.L.M. had originally chosen as the most suitable—in other words, the shortest. Without any reason being given, Turkey refused its consent to the


REGULARITY WEEKLY AIR MAIL SERVICE
AMSTERDAM - BATAVIA — K.L.M. AIRLINES.
EASTBOUND
NUMBER OF DAYS
1 2 3 4 5 6 7 8 9 10 11 12 13 14
DATES OF DEPARTURE FROM AMSTERDAM 1-1-32 TILL 1-1-33
1 JAN 32 TILL 1 JAN. 33 AVERAGE OF 52 TRIPS EAST BOUND
10½ DAYS
BAD WEATHER
VERY BAD WEATHER
MAXIMUM, AGREED UPON WITH DUTCH POSTAL ADMINISTRATION: 12 DAYS
REGULARITY WEEKLY AIR MAIL SERVICE
BATAVIA - AMSTERDAM — K.L.M. AIRLINES
WESTBOUND
NUMBER OF DAYS
1 2 3 4 5 6 7 8 9 10 11 12 13 14
DATES OF DEPARTURE FROM BATAVIA 1-1-32 TILL 1-1-33
1 JAN. 32 TILL 1 JAN. 33 AVERAGE OF 52 TRIPS WEST BOUND
9 8/10 DAYS
PLANE SUNK AWAY ON WET GROUND
MAXIMUM, AGREED UPON WITH DUTCH POSTAL ADMINISTRATION: 12 DAYS

"THE MAILS MUST GO THROUGH": Diagrams showing the regularity attained during a year's operation.

ONE OF THE TWO TYPES USED: The Fokker F.XII is here shown fitted with "spats," but these have now been discarded.

K.L.M. flying over its territory. And it is not only the Dutch air traffic which found itself here up against a stone wall. Nevertheless, it would seem that a change in the Turkish attitude is imminent.

To what circuitous routes one is compelled, owing to various considerations, is seen from the following comparison of distances between Amsterdam and Baghdad:—

Amsterdam-Baghdad, direct ...	3,775 km. (2,360 miles).
Amsterdam - Budapest - Stamboul-Aleppo-Baghdad ...	4,030 km. (2,520 miles).
Amsterdam - Budapest - Athens-Cairo-Baghdad	4,865 km. (3,040 miles).
Amsterdam - Marseilles - Rome - Athens-Cairo-Baghdad ...	5,350 km. (3,345 miles).

However, as already stated, after all considerations of desirability, the *ground organisation* existing at a certain moment finally determines the route; in other words, opportunity to land, to refuel, and to pass the night. With every machine, the connection between its radius of action and the loading capacity is very simple, viz., a connection controlled by the maximum admissible weight of the machine, which, in its turn, is determined by the constructional strength and its take-off qualities and rate of climb. The transport of pay load being the object, the final choice of the route—taking the various other considerations mentioned into account—is dependent on the existence of available landing grounds, regularly distributed. The weakest link determines the strength of a chain, and so the greatest distance between the two successive aerodromes determines the maximum profitable load which, from one end to the other, can be carried by each machine from Amsterdam to Batavia. In this way the following route was settled upon:—From the beginning of May till the end of October: Amsterdam-Halle-Leipzig-Budapest - Athens - Mersa Matruh - Cairo - Gaza - Baghdad - Bushire - Jask - Karachi - Jodhpur - Allahabad - Calcutta - Akyab - Rangoon - Bangkok - Alor Star - Medan - Palembang-Batavia, the total distance being 14,185 km. (8,825 miles), while from November till the end of April the first part of the route is changed via Marseilles, Rome and Athens, which is some 500 km. (300 miles) longer.

Relay System

A route like that indicated above may be flown in various ways. A certain stage of the route may be assigned to a certain group of pilots, on which stage they might specialise. The route Amsterdam-Batavia could be divided into definite sections, such as Amsterdam-Baghdad, Baghdad-Calcutta, Calcutta-Batavia. At present the K.L.M. is the only company operating a long air line that occupies the standpoint of regarding the aeroplane as a ship which makes the journey out and home with the same crew. This system has the following advantages—one need not station material or personnel *en route*, which in the first place means a very great economy. It is self-evident that the stationing of aeroplanes along the route—machines which require upkeep, burdened with landing and housing fees, and where the proportion between rest hours and flying hours would be unfavourable—is extraordinarily expensive. The same applies to the stationing of personnel. But the final and chief argument against stationing machines along the route is that it would mean a considerable increase of the fleet. The weekly service Amsterdam-Batavia can be operated with six machines. Further, there is the consideration that each machine arriving at Bandoeng forms a reserve during one week. A permanent crew flying the machines out and home again has several advantages. In the first place, the crew feels itself more responsible for the journey *as a whole* than one which only serves a section. In the second place, the crew, after nine or ten days, can take a rest in the agreeable climate of Bandoeng and be back in Holland again in a month in their own home and with their own family. The rapid passage through different countries and climates has no unfavourable effects.

Instead, then, of stationing personnel and material along the route, the storage of reserve parts for engines and machines sufficed from the very beginning, which reserve parts, since the F.XII and the F.XVIII machines were commissioned for the service, have been restricted to a minimum. Nowhere between Amsterdam and Batavia has the K.L.M. its own personnel.

Each crew makes four flights out and back annually. The outward journey lasts 9 to 10 days, the period of rest at Bandoeng 13 or 12 days, the journey home again 9 to 10 days, after which follows a week's holiday. Further, the crew remains seven weeks on the European lines of the K.L.M. Between each departure for Batavia, thus, there lie 13 weeks, and as four weeks multiplied by 13 make a year, there are at least 13 crews needed, each of which performs four journeys. It must be noted that this system is only possible owing to the fact that the K.L.M. has an important European service beside the Amsterdam-Batavia line.

The Choice of Stages

The principal factor which determines the division in daily stages is the rule set by the company that the start must be made a short time before sunrise and the last landing made at least an hour before sunset, which means, practically speaking, that one only flies by daylight. The considerations which led to this decision were, among others, the rather slight experience of night flying possessed by the K.L.M., the fact that the ground organisation on the Indian route is not yet prepared for night flying, and, finally, the rapidly increasing fatigue, if *one* crew, in addition to working the whole day, should be called upon to continue working during a part of the night.

This flying system has led to a division of the approximately 14,500 km. (9,000 miles) long route into nine daily stages in summer and ten in winter.

One flies eight to nine hr. a day with a speed of 185 to 195 km. per hr. (115 to 125 miles per hr.).

It is clear that as long as this system is maintained (one machine with *one* crew for the whole journey and flying for the most part in daylight), the journey on a chosen route can only be shortened by an increase in the speed of the machines, and it is just this increase in speed which the K.L.M. has always had in view (in 1929, the F VIIb machines with a cruising speed of 165 km. per hr. (100 miles per hr.); in 1931, the F XII machines with 185 km. per hr. (115 miles per hr.); and in 1932, the F XVIII machines, which attained a speed of 195 km. per hr. (122 miles per hr.)).

One of the bases on which the flying scheme has rested,

THE LATEST TYPE IN OPERATION: The Fokker F.XVIII taking off for Batavia.

and, indeed, still rests, is the available daylight. The great differences in this respect over the part of the route between Amsterdam and Cairo during the favourable summer period and in the middle of the winter have resulted, together with the somewhat longer winter route, in two time-tables—in summer nine days and in winter ten.

In considering the question of available daylight, the following facts must also be taken into account. The difference in time between Amsterdam and Batavia, as a result of the difference in longitude, amounts to about seven hours. In other words, flying from west to east, seven hours of daylight is lost on the whole journey, whilst in the reverse direction the same number of hours is won, which results in a difference of no less than 14 hours of available daylight between the journey out and the journey home.

It is the intention to perform, in the summer of 1933, the journey in eight days and in the autumn and winter in nine days.

Choice of Cargo

In the above, we remarked, incidentally, that one would have to reckon with the transport of mail, passengers and goods. The position adopted by the K.L.M. from the very beginning is that the cargo carried between Amsterdam and Batavia must be mixed. As this position has lately been repeatedly contested, it might be well to elucidate it here.

The basis, indeed, of the air service between Amsterdam and Batavia has always been, and is still today, the transport of mail, and it is exclusively the contract for the carriage of mail which has enabled the air line to operate first a fortnightly and afterwards a weekly service. The reference here is to an agreement with the postal authorities in Netherland, whereby the K.L.M. undertakes to transport mail to a maximum of 500 kg. (1,100 lb.) weekly in both directions, whilst the Post Office, on the other hand, agrees to pay for the transport of 500 kg. mail, even if this amount is not reached.

The position has thus become as follows. The payment agreed upon enables the K.L.M. to cover, to a large extent, the costs really made. On the other hand, the Post Office must endeavour to recover the sum thus expended from the public in the form of extra postage for air transport. When the Post Office receives 500 kg. mail for transport from terminus to terminus, it is able to cover its expenditure. Above the 500 kg. it begins to make a profit; below the 500 kg. it suffers a loss. At the present the latter is the case, as the mail transported from terminus to terminus amounts to about 285 kg. (575 lb.) weekly. On the other hand, mail is collected and delivered at various points *en route*, so that the total mail carried on certain stages already amounts to more than 350 kg. The rate of six gold centimes per 100 gram per 100 km., internationally agreed upon, serves as basis for the compensation paid for carriage of mail on the intermediate stages. Naturally, the more regular and rapid the service is the greater the inclination on the part of foreign postal administrations to make use of it. Expectations entertained with regard to the mail transport have, generally speaking, not been disappointed. When the weekly service was instituted one expected, during the first three months, an average of 150 kg. per flight, whilst in reality it amounted to 244 kg. Over the second and third quarter, the estimate was 200 kg. and the reality 238 kg. For the fourth quarter the estimate was 300 kg., which amount was not reached; the average was then 285 kg.

The proportion between the Netherlands mail carried by aeroplane and by boat is extremely favourable for the K.L.M., viz., 1 to 3; that is to say, that already the K.L.M. carries 25 per cent. of the total first-class mail between Netherland and India.

The agreement made prescribes that the K.L.M. shall have no voice in mail arrangements made with foreign administrations or in the fixing of postal rates. The K.L.M., however, conceives its mail contract in the spirit that, on its side, it must do everything in its power—also by means of direct negotiations and propaganda abroad—to develop the transport of mail in order that this can become a paying proposition for the Post Office as soon as possible. A considerable increase in the mail transport resulted from the introduction of 5-gram letters, whilst recently a lower rate was initiated for letters up to 10 gram. If the K.L.M. had hitherto restricted itself exclusively to the transport of mail, neither party would have benefited. The journey would not be of shorter duration than it is now; the income of the Post Office would not have been bigger, or one might put it differently and say that the loss for the Post Office would not have been less. As for the K.L.M. itself, the mail contract formed a solid basis for carrying out the flights where otherwise the company would also have suffered a loss. It is an erroneous idea to imagine that the transport of passengers has resulted in the choice of less rapid material than might have been possible. The K.L.M. is not interested in designs of rapid mail machines on paper, the qualities of which have still to be proved. In the construction of its material it is guided by the requirements demanded by the flights to India as these are at the present time. One of the chief requirements we have already mentioned, the equipment with three engines and the ability to fly with two. The following requirement, related to the system described above, was a crew of four, viz., two pilots, a telegraph operator and a mechanic. A third requirement was the existence of sufficient comfort on board to enable the crew to rest during the flight. If, with these requirements in view, you sketch an aeroplane round a crew of four, you will arrive at the present shape which automatically leaves sufficient room for a few passengers and a quantity of freight.

What does one achieve with this transport over and above the mail? In the first place, one supplies an existing demand from the side of the public, and the assertion repeatedly made, without any proof whatever, that the time is not yet ripe for the rapid transport of passengers is completely refuted by the facts. The extra revenue from the transport of passengers and freight means not only that the K.L.M. suffers no loss in operating the service, but also that the Indian route requires no subsidy, apart from the mail contract. On the contrary, the profit made flows back into the national exchequer, which again means that the subsidy granted to the K.L.M. is finally

considerably reduced. Although the Post Office still suffers a loss on the exploitation of this service, which means a loss of State money, on the other hand, considerable sums flow back into the national exchequer, and with the bigger aeroplanes these sums will also increase considerably. This is not the only advantage, however. With the increase of these sums, the postal contributions can correspondingly be reduced which finally means that the time will come when the public will have to pay less on postage. This can never be achieved when the company devotes itself exclusively to the transport of mail, though mail alone, at the actual postage, would suffice to pay the cost of transport on this particular line. The plans which, outside the K.L.M., are the subject of much discussion at the present moment, are based on the supposition that a rapid speeding up of the service, thanks to the operation of a rapid mail machine which has already been designed, would lead to such a considerable increase in the quantity of mail carried, that the Post Office would no longer suffer a loss and that the income derived from the postage paid by the public would suffice to cover the costs of the flight. This is a theory which has still to be proved. Moreover, this plan holds absolutely no prospect of future improvement, apart from the question whether a regular service with such a machine, with a small crew and insufficient comfort on board, will be possible. Over against that, we have the position that with a normal development of the mixed cargo transport, the same result can be reached in a short time by an increase of speed and longer flying stages, and then not only more favourable financial results can be achieved—for the Post Office as well as for the K.L.M.—but also, in addition to the mail transport, another important transport can be developed, viz., that of passengers and goods. There is no reason why a passenger should travel less quickly than a letter does. When the exchange of written thought between two points on this globe has become so important that speeding up by means of air transport is felt necessary, there exists doubtlessly the same necessity for a quick exchange of views in personal conversation and the need of quick travel between Europe and the Far East has been fully proved. The object aimed at with mixed cargo transport becomes therefore greater and of infinitely greater advantage. It is a short-sighted policy to consider present results alone, results which, to judge from the number of passengers carried, are undoubtedly becoming more favourable.

The K.L.M. intends in 1934 to cover the route between Amsterdam and Batavia in six days and trusts within a few years to be able to reduce this to four days. We shall return to this point again towards the end of this paper.

(*To be continued.*)

Finnish Air Traffic

THE amount of regular air traffic, passengers, mail and freight, carried over the air routes operated by Aero O.Y. (Finnish Air Lines) during 1932 was as follows:—Kilometres flown, 257,440 ; passenger-kilometres, 609,310 ; luggage and freight, tonnes-kilometres, 14,040 ; mail, tonnes-kilometres, 10,157.

Kirkwall Air Service

A SUITABLE landing ground has at last been found at the Kirkwall end of the Kirkwall-Thurso-Wick-Inverness air route. The landing ground covers 30 acres and is known as Wideford House Park ; it lies only a mile and a-half out of the town. The results of the air service will be that Kirkwall will now receive daily newspapers at 8 or 9 a.m. instead of at 5 or 6 p.m., and various other daily journals on the noon of publication day, instead of on the evening of the day following publication. It is understood that the Postmaster-General will authorise the carrying of mails as soon as the service is in operation. Also, passengers travelling from Kirkwall to Inverness, or *vice versa*, will make the journey in 50 min. instead of the 13-14 hr. which the present journey takes by road, steamer, road again, and finally railway.

An Air-Mail Inquiry Office

Owing to the increase of air-mail transport—letters airborne in British aircraft having grown in numbers from 200,000 a year, eight years ago, to more than 6,000,000 a year at the present time—Imperial Airways have now established at the Airway Terminus, Victoria Station, London, a special department to deal with inquiries concerning the flying mail and also to distribute information on this important subject. Advice and information are given about such matters as air-mail rates, latest times for posting and times taken in transmission by air to all parts of the world.

Controller of Australian Civil Aviation

COL. BRINSMEAD, the Controller of Civil Aviation in Australia, has been superannuated owing to the injuries which he received in December, 1931, when a Dutch aeroplane, in which he was travelling, crashed in Siam. It is understood that Mr. E. C. Johnstone, the Deputy-Controller, will succeed him.

"ATALANTA'S" HOME : The Whitley Abbey works of Sir W. G. Armstrong Whitworth Aircraft Co., Ltd., are the birthplace of many notable aircraft, one of the most recent being the "Atalanta" with 4 "Double Mongoose" engines, which is being used by Imperial Airways on the African route. (FLIGHT *Photo.*)

AIRPORT NEWS

CROYDON

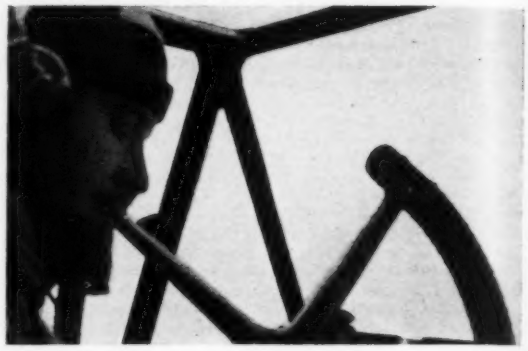
WITH careful consideration for the air traveller, the K.L.M. have arranged a summer programme which presents many new advantages. There will be four services to and from Croydon each day. The first service will start from the Airport at 7 a.m. and will run to Berlin, arriving there at 11.30 a.m. The plane returning will leave Berlin at 4.20 p.m. and reach Croydon at 9.20 p.m. This will be an entirely new service on which the new Fokker F.20's will be employed. Hitherto, it has not been possible to make a day trip to Berlin return, with a five-hour stay, by ordinary air service. Next will be the 10.30 a.m. local service to Rotterdam and Amsterdam only, making certain connections with other European cities. This will be followed by the departure of the Scandinavian Air Express at 1.15 p.m., which is the fastest link between London and Copenhagen-Malmo. This service, by the way, has been run since 1925 by K.L.M. and A.B.A., and is a regular express service, stopping only at Amsterdam for sufficient time for lunch. The time taken for the journey from Croydon to Malmo will be 6½ hr. A slow service will also be run via Amsterdam and Hamburg, taking 7 hr.

Finally, the increasingly popular 7 p.m. service from Croydon to Amsterdam completes the schedule. By using this and the early morning inward service, which connects with the Scandinavian night air-mail and reaches Croydon at 6.45 a.m., it is possible for a business man to visit London, spend approximately 12 hr. here and return the same day to Amsterdam.

Mr. Bertram, Deputy Director of Civil Aviation; Capt. Enthwistle, Chief of the Air Ministry Meteorological Office; Flt. Lt. W. A. Duncan, of the same office; and Wing. Com. Warrington-Morris, Chief of the Air Ministry Signals Branch, all returned last week by D.L.H. from Berlin, where they have been attending an international conference on wireless and weather services.

On Monday, January 30, there was considerable fog on the air routes, particularly in the Channel, and several planes bound for London were compelled to land on the French side of the Channel. They continued to Croydon the next day.

Wednesday, February 1, was also an unfavourable day for flying, owing to a fierce gale in the Channel and the South-East of England, which interfered to some extent with the Continental air services. There were low clouds and high winds, and at Lympne the clouds were less than 150 ft. high, while the wind came in gusts of over 50 m.p.h. No light aeroplanes took off from Croydon. A French air liner returned owing to weather shortly after leaving Croydon, and the Brussels and Cologne services, as well as Imperial Airways' 12.30 service to Paris were cancelled.



THE SKIPPER: An impressionistic portrait of Capt. O. P. Jones, of Imperial Airways, at the wheel of one of the H.P. 42 airliners.

Hillman Airways opened a branch office at Croydon at the beginning of the month and sent one of their "Puss Moths" to Croydon to be kept there permanently.

M. Flandin, the ex-French Minister of Finance, returned to Paris by Air Union aeroplane on Monday, February 6, after a short stay of eight days in London. Gen. Spears accompanied him to the aerodrome to see him off.

The first annual dinner of Croydon Aerodrome is to be held on Monday, February 27, at the Greyhound Hotel, Croydon. A committee has been formed to promote the dinner, as it is felt that some social interest would be generally welcomed by the many employees at the airport. An attractive programme has been arranged and the novel menu for the dinner will appeal to the imagination of many of those engaged in the operation of the air services. The dinner will be followed by a splendid variety concert, and the evening's entertainment will be concluded with two hours' dancing until 1 a.m. Maj. Leslie F. Richard, Chief Officer of the Aerodrome, will take the chair and our old friend Mr. Bill Lawford is to be toast master. Tickets may be obtained from Mr. G. W. Thompson, c/o The Air Ministry, Croydon Aerodrome.

Total number of passengers for the week 718; freight, 41 tons 3 cwt.

"HORATIUS."

FROM HESTON

THE fog was so thick on Monday, January 30, during the whole of the day that flying was out of the question.

Tuesday, January 31, was a real nice day, and the Flying School had a busy day to finish the month. Two of the soloists were members of the Household Brigade Flying Club, both anxious to complete their tests for the "A" licence. One new pupil joined the Flying School. Banco had a charter with a press photographer to take pictures of the railway accident at Loughborough. Mr. Singer arrived from Abbeville—where he had been forced to land on Monday owing to the bad weather—in a "Gipsy III Moth."

Wednesday, February 1, was an unsuitable day for flying, as the wind was at gale force and it was impossible to carry out any instruction. Mr. Eric Nelson arrived in an Avro from Brooklands and was glad to have men to hold his wings on landing.

Thursday, February 2, however, was another beautiful and consequently busy day for the Airwork School of Flying pupils and private owners at Heston, several of whom made a hurried visit to the airport to fly before dusk. Capt. Baker was fully employed and two new pupils joined the School, while another booked an appointment for a trial lesson later in the week. The machines flying at Heston were nine "Moths"; three "Avians"; two "Spartans"; two Klemms; one "Civilian Coupé"; one Percival "Gull"; one Desoutter and one Segrave "Meteor." One machine cleared Customs and left for Paris.

Friday, February 3, opened with a certain amount of ground mist, but not sufficient to prevent flying. One machine cleared Customs and left for Jersey, two for Paris, one for Brussels, while one arrived from Paris. The members of the Household Brigade Flying Club were making good use of their machine, it being in full use from lunch onwards.

With rain threatening and a strong and gusty wind on Saturday, February 4, several pupils were prevented from flying solo, but were quite content to have further bouts of dual instruction. The new quarters for Comper Aircraft Co. are already beginning to take shape, the framework of the building being completed. About lunch time the rain arrived and the cloud was almost on the ground, which put a stop to instruction. Mrs. Williams (Lady Heath) christened the "Moth" G-ACBU—in which Mr. Victor Smith flew from Cape Town to England—and which has now been purchased by her and her husband. She

agreed that it was wicked to waste good champagne for the purpose and therefore substituted a grease-gun!

Capt. Ferguson piloted one of the Airwork School of Flying machines to Beachy Head with a cinematograph operator for views of the wrecked s.s. *Ellin*. Banco also had a charter for a similar purpose, while another of their machines proceeded to Swansea for pictures of the International football match, calling at Cardiff on the way back for other pictures. It was a very rough trip to Swansea and back.

February has produced up to the present various types of weather. On Sunday, February 5, there was a strong gale, which prevented any pupils flying solo. However, the Flying School put in several hours' dual instruction, in fact, all available machines were in the air at one time. Just after 3.30 p.m. the gale increased to such force that all machines had to be put in the hangars. The manhandling of taxying machines and skill required to land caused great excitement among the large number of Club members present.

MUNICIPAL AERODROMES

IT would seem that the year 1933 is likely to see the advent of several airports in the British Isles. Town Councils are beginning to realise that the time has arrived when conservative caution must give way to necessary constructive policy.

Manchester for some years has talked, and put forward vague suggestions, concerning the matter, but at last—and we believe the energetic Mr. Hillman is an encouraging factor in the matter—they seem really to be taking the matter seriously.

At Chorley, in Lancashire, there is a possibility that an airport will be included in the new town planning scheme, land at Runshaw Moor being developed for that purpose.

Farther south, Exeter Council are seriously considering the purchase of Waterslade Farm (Honiton Clyst), approximately 283 acres. Near London, Birchington Chamber of Commerce has requested the Thanet Rural District Council to confer with other local authorities with a view to finding a suitable site for a local airport. In Scotland, Renfrew Aerodrome, formerly occupied by the City of Glasgow Squadron, A.A.F., is to be converted into the first civil airport of Scotland, and will provide a home for the Scottish Flying Club.

Airports may be expensive to develop, due to the amount of land required and the expense of levelling, but it is only a matter of time before every large city must have its municipal airport. The word "must" is no exaggeration; airports will be as necessary in a few years' time as railway stations and car parks are at present, and with cities and towns growing out and around, the sooner a site for an airport is picked the better, and if the airport is to be a financial success the municipality must arrange quick and efficient transport from the centre of the city or town out to its airport. Many other schemes for municipal airports are afoot, and an indication of the interest displayed may be gathered from the following list of towns issued by the Air Ministry in this connection:—

Towns which have Licensed Aerodromes (13)

Blackpool	Ipswich	Nottingham
Bristol	Leeds–Bradford	Plymouth
Cardiff	Liverpool	Portsmouth
Hull	Manchester	Stoke
		Southampton

Towns which have Purchased Sites (5)

Carlisle	Leicester	Walsall
Doncaster	Norwich	

Towns which have Reserved Sites in their Town Planning Schemes (9)

Basingstoke	Milton U.D.C.	Southwold
Blyth	Rotherham	Weston-super-Mare
Maidstone	Skegness	York

Towns which have had Sites Inspected (92)

Abergavenny	Colchester	Huyton	Southport
Aberystwyth	Crewe	Inverness	St. Albans
Aberdeen	Derby	Irvine	Scarborough
Aldershot	Dundee	Isle of Man	Sheffield
Aylesbury	Eastbourne	Kidderminster	Slough
Barnet	Edinburgh	Leek	South Shields
Barnsley,	Exeter	Littlehampton	Stirling
Bath	Falkirk	Lincoln	Stratford
Bedford	Gateshead	Lytham St. Annes	Swansea
Bexhill	Glasgow	Middlesbrough	Taunton
Bognor	Grantham	Middleton	Tynemouth
Bournemouth	Greenock	Motherwell	Walthamstow
Birkenhead	Grimsby	Morecambe	Warwick
Birmingham	Gt. Yarmouth	Newcastle	Weymouth
Bridlington	Gloucester	Newton Abbot	Winchester
Brighton–Worthing	Guildford	Newport (Mon.)	Windermere
Belfast	Halifax	Northampton	Woking
Burnley	Harrogate	Northam, Devon	Worcester
Burton	Hastings	Peterborough	Warrington
Cambridge	Harwich	Poole	West Bromwich
Cheltenham	Hereford	Renfrew	West Hartlepool
Chester	Huddersfield	Rochester	Wolverhampton
Chorley	Huntingdon	Southend	Wellingborough

Towns which have Displayed Interest in Aerodromes other than Above (57)

Airdrie	Hamilton	Pwllheli
Axbridge	Haywards Heath	Reading
Bangor	Haversford West	Redruth
Barrow	Kingston	Rochdale
Bolton	Lancaster	Rugby
Buckie	Llandrindod Wells	Sunderland
Burry Port	Loughborough	Salisbury
Cannock	Luton	Shrewsbury
Caerphilly	Mablethorpe	Thornton, Lancs.
Chesterfield	Merthyr	Truro
Coventry	Montrose	Wadebridge U.D.C.
Darlington	Neath	Walton-on-Naze
Dornoch	Newtownards	Wallasey
Dover	Nuneaton	Watford
Dunfermline	North Berwick	Wigton U.D.C.
Durham	Oxford	Wrexham
Folkestone	Perth	Winsford
Gillingham	Pontypridd	Witney
Gravesend	Preston	Yeovil

A TRAGIC FATALITY

LT. COM. G. RODD, R.N., was killed at St. Moritz in a crash when flying his "Puss Moth" on Tuesday, January 31. With him were Mr. Charles Schäer, the Swiss ski-ing instructor. From the reports at present to hand it would appear that Com. Rodd neglected to allow sufficiently for the effect of the lake being at an altitude of 6,000 ft.

Com. Rodd was a very skilful, but perhaps somewhat exuberant, pilot and had, it is stated, already been warned by the Mayor of St. Moritz that he ought to give up much of his low flying and stunting in the district. It would seem that after taking off he flew very low indeed between the two hotels and then attempted some manœuvre which looked like a roll. When in approximately a vertical bank the machine side-slipped straight into the ground from a height of about 70 ft. He himself was with great difficulty extricated from the wreckage after some 20 min., but died on his way to the hospital. A public funeral was held on Friday, February 3, and the body was afterwards sent by rail to London.

Mr. Schäer received injuries to his skull and left eye, and at the time of writing fears were entertained for his recovery.

Com. Geoffrey Rodd was a particularly skilful pilot and a fine navigator. He used his "Puss Moth" on all possible occasions and had probably flown this type of machine as much as anybody in the world. He travelled abroad a great deal and invariably went by air; he possessed a "B" pilot's licence and during the last year had done a very great deal of flying for the film industry.

It will be remembered that he flew Miss Peggy Salaman's "Moth" in the King's Cup race in 1931. Com. Rodd was just the type of pilot whom we can ill afford to lose. He was wealthy and therefore able to fly more or less when and where he pleased, and he undoubtedly did a very great deal to help aviation by introducing his large circle of friends to the air.

We understand that the Swiss authorities have impounded certain parts of the machine and are holding an official investigation.

AIRISMS FROM THE FOUR WINDS

Mr. Mollison for South Africa

Mr. J. A. Mollison left Lympne at 8.12 a.m. on Monday, February 6, on an attempt to fly to South America in three and a half days. He intended to land at Barcelona for fuel, then proceed to Thies, in French Senegal, which is 2,800 miles from Lympne. From there he will cross the South Atlantic to Port Natal, Brazil, a distance of 2,000 miles. Mr. Mollison landed at 5.10 p.m. at Barcelona and left again at 9 p.m. for Cape Juby, Rio de Oro. He is reported to have stated before he left that his intention was to fly from South America to New York and then home across the North Atlantic. From a point of view of comparison, it will be remembered that Costes and Le Brix, the French airmen, on October 10, 1927, flew from Paris to Port Natal in just over five days, doing the actual South Atlantic crossing in 19 hr. 50 min., while Bert Hinkler took 22 hr. to do the trip in the opposite direction. Mr. Mollison has expressed the opinion that British light aeroplanes want advertising in South America, which is very true, for the South American peoples are beginning to realise the utility of aeroplanes as a means of transport over thinly populated areas, and unless British machines are pushed, America will get the markets, or, perhaps, we shall even be beaten by our Continental rivals. So if Mr. Mollison really has the British aircraft industry at heart, he ought to forget his long-distance records for a time and demonstrate the machine he is flying in the South American countries. Mr. Mollison is flying his D.H. "Puss Moth," *Heart's Content*, fitted with a "Gipsy Major," 130-h.p. engine.

Mr. Victor Smith Tries Again

Mr. Victor Smith, the young South African airman, left Southampton Aerodrome on the morning of Tuesday, February 7, on a second attempt to beat the England-Capetown record. He is flying a Comper "Swift" (75-h.p. "Pobjoy"), and reached Bordeaux shortly after 12 noon.

The R.A.F. Singapore—India Flight

FOUR "Horsleys" of No. 36 (T.B.) Squadron, which is stationed at Singapore, are engaged on a flight to India and back. The machines started from Seletar Aerodrome on January 23, and their route is Alor Star, Tavoy, Rangoon, Akyab, Calcutta, Allahabad, Delhi, Lahore and Peshawar, where they were to stay for a week. The route was to be varied on the return journey, and the total mileage would amount to over 7,000. A telegram to the Air Ministry on February 4 notified the arrival of the four machines at Peshawar, thus completing the outward journey.

Air Search for Lost Oasis

LADY CLAYTON EAST CLAYTON is shortly to set out on a search for the lost oasis of Zerruna. She will thus be continuing the work started by her husband who, early in 1932, set out on an air and motor journey to find the same oasis; he was lost for several days, and subsequently died after returning home. Lady Clayton has the consent of the Egyptian Government and is taking a reserve pilot, Lt. Com. Raundall.

The Prince Flies Home

THE Prince of Wales returned by air on Thursday from Cornwall, where he has been visiting his properties and farms.

Airmen's Lucky Escape

AN aeroplane, piloted by Henry Guy Rivers Malet, of Edinburgh, with Charles F. Almond as passenger, while landing at Haslingden, Lancs, to obtain petrol on Tuesday night, hit an electric cable. The two men were uninjured, although the machine was badly damaged.

THE CONTENTS OF THE *Hearts Content*: Mr. J. A. Mollison's important passenger in his "Puss Moth" on the England-South America attempt is a petrol tank, shown above, which contains 169 gall. of fuel. (FLIGHT *Photo.*)

Two Arctic Explorers Found

THE bodies of Messrs. N. B. Calder and W. B. Nadin, who have been missing since January, 1931, have been found frozen beside their machine near Fort Rae in the North-West Territories of Canada. Apparently their aeroplane had crashed after the airmen had lost themselves in a snowstorm; they had been thrown clear, though the machine had been destroyed by fire.

Segrave Trophy for Mrs. Mollison

THE Segrave Memorial Trophy, which is awarded annually, is to be given this year to Mrs. Mollison for her recent record return flight to Capetown.

Pilot Lands in Avalanche

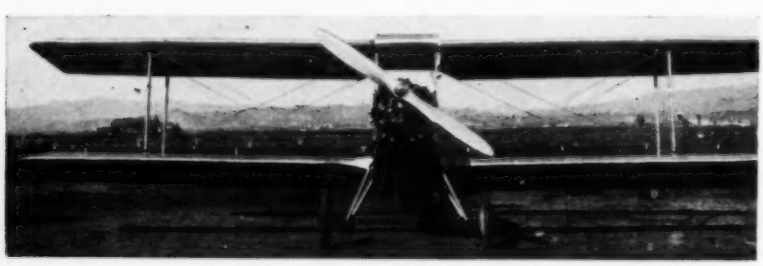
ON January 31 a Swiss military aeroplane hit an unseen telegraph wire while flying in the mountainous district near Davos. The aeroplane was so badly damaged that the pilot decided to abandon the machine and trust to his parachute; unfortunately he landed in the path of an avalanche and was killed.

Gustav Lilienthal Dead

HERR GUSTAV LILIENTHAL, the German inventor, has died recently of heart failure, at the age of 84. He was an architect and a member of the Humboldt Academy, and for some years had experimented with an ornithopter type of flying machine, that is, a flapping-wing machine, but it never reached the actual flying stage.

The 1933 Lockheed "Orion"

THE Lockheed Aircraft Corp., of Burbank, Calif., announces that it is ready to deliver its 1933 "Orion" model with a cruising speed of 200 m.p.h.—more than double the speed of five years ago. The increase in speed over the present model is gained by installing the new Pratt & Whitney S1D1 "Wasp," improving the wing fillets, redesigning the tail assembly, putting the landing lights inside the leading edge of the wing, and various other refinements developed by the Lockheed engineering department. The payload with a 750-mile cruising range remains at 1,172 lb. Delivery date is approximately 40 days from the time the order is placed with the factory.



THE POBJOY IN SPAIN: This Spanish biplane (on the Malaga Aerodrome) was designed by Senor Jose Freuller, and is fitted with a Pobjoy "R" engine. Senor Freuller is also putting into production a monoplane, which will likewise be powered with the Pobjoy engine.

THE ROYAL AIR FORCE

London Gazette, January 31, 1933

General Duties Branch

Group Captains L. A. Pattinson, D.S.O., M.C., D.F.C., and F. L. Robinson, D.S.O., M.C., D.F.C., are appointed Air Aides-de-Camp to the King (Jan. 1) in the vacancies created by the promotion to air rank on that date of Group Captains F. K. Haskins, D.S.C., and J. E. A. Baldwin, D.S.O., O.B.E.; Air Commodore C. L. Courtney, C.B., C.B.E., D.S.O., is appointed Director of Training, Air Ministry, vice Air Commodore W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C. (Jan. 30).

The follg. are promoted with effect from Feb. 1:—*Flight Lieutenants to be Squadron Leaders.*—A. J. Rankin, A.F.C.; H. L. Rough, D.F.C. *Flying Officers to be Flight Lieutenants.*—A. McKee, B. A. J. Crummy, R. W. M. Clark.

The follg. Pilot Officers are promoted to the rank of Flying Officer:—R. K. Brougham, J. G. Cardale, C. M. H. Outram, P. S. H. Ross (Jan. 10); L. T. Jearey, J. O. Willis (Jan. 26).

Wing Comm. A. J. Capel, D.S.O., D.F.C., is placed on half-pay list, Scale A, from Jan. 4 to Jan. 22 inclusive; Sqdn. Ldr. H. M. Massey, M.C., is placed on half-pay list, Scale B, from Jan. 17 to Jan. 22 inclusive (substituted for *Gazette* Jan. 10); Group Capt. F. M. Murray, D.S.O., M.C., is placed on half-pay list, Scale A (Jan. 31); Flying Officer F. L. Truman is transferred to Reserve, Class C (Dec. 9, 1932) (substituted for *Gazette* Dec. 13, 1932). The follg. Flying Officers are transferred to Reserve, Class C (Feb. 1); G. D. Hoyland, R. H. Cave Penney.

Flying Officer H. C. Friday resigns his short-service commn. (Jan. 22); (Flying Officer C. N. McLoughlin relinquishes his short-service commn. on (account of ill-health (Jan. 31); the short-service commn. of Acting Pilot Officer on probation J. G. Rhys-Jones is terminated on cessation of duty (Feb. 1).

Stores Branch

The follg. Pilot Officers on probation are confirmed in rank and promoted to rank of Flying Officer (Jan. 8):—A. R. Morton, K. N. Smith. Flt. Lt. E. I. T. Duffield is placed on retired list (Jan. 31).

Errata

In *Gazette* of Jan. 24. Flight Cadets granted permanent commns. in the General Duties Branch.—For Ian Grant Mackay *read* Ian Grant MacKay; for Percy Stanley Salter *read* Peter Stanley Salter; for Joscelyne Forgan Houssemayne Du Boulay *read* Joscelyne Forgan Houssemayne du Boulay; for Alfonso Rudolph Gordon Bax *read* Alfonso Rudolf Gordon Bax.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss F. M. Morey is placed on retired list on account of ill-health (Feb. 1).

ROYAL AIR FORCE RESERVE

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

Flying Officer H. W. Knott is transferred from Class C to Class A (Nov. 10, 1932); Flt. Lt. R. F. Durrant, A.F.C., is transferred from Class B to Class C (Dec. 9, 1932); Flying Officer J. W. Martin relinquishes his comm. on account of ill-health (Feb. 1). The follg. Flying Officers relinquish their commns. on completion of service:—H. S. Eaton (Dec. 23, 1932); F. E. North (Jan. 3); P. P. Grey, P. E. Nicholl, F. F. Wilkinson (Jan. 14); W. E. (Gandell, M.M. (Jan. 27). Flying Officer H. W. Petter resigns his commn. (Jan. 18).

Stores Branch

Flt. Lt. L. R. L. Brown is transferred from Class B to Class C (July 17, 1932).

SPECIAL RESERVE

General Duties Branch

Pilot Officer G. B. Iles is promoted to rank of Flying Officer (Jan. 25).

AUXILIARY AIR FORCE

Stores Branch

The follg. are granted commns. as Flight Lieuts. whilst serving as Civilian Stores Officers with Auxiliary A.F. Units (Feb. 1):—

No. 600 (City of London) (Bomber) Squadron.—F. J. B. Powell, M.B.E. Flight Lieutenant, Retd.).

No. 601 (County of London) (Bomber) Squadron.—G. Baker (Flight Lieutenant, Retd.).

No. 603 (City of Edinburgh) (Bomber) Squadron.—H. F. Webb (Flight Lieutenant, Retd.).

No. 608 (North Riding) (Bomber) Squadron.—J. Hobbs (Flight Lieutenant, Retd.).

No. 604 (County of Middlesex) (Bomber) Squadron.—L. F. Caunter Flying Officer, R.A.F.O.) is granted a commn. as Flying Officer whilst serving as Civilian Stores Officer with Auxiliary A.F. (Feb. 1).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain S. Smith, D.S.O., A.F.C., to Station H.Q., Boscombe Down, 26.1.32, to command *vice* G./Capt. A. Corbett-Wilson.

Wing Commander A. J. Capel, D.S.O., D.F.C., to No. 22 Group H.Q. to Farnborough, 23.1.33, for liaison duties with Aldershot Command.

Squadron Leaders: P. F. Fullard, D.S.O., M.C., A.F.C., to No. 2 (A.C.) Sqdn., Manston, 21.1.33, to command *vice* S./Ldr. S. E. Toomer D.F.C. F. W. Trott, O.B.E., M.C., to No. 57 (B) Sqdn., Upper Heyford, 19.1.33, to command *vice* S./Ldr. H. G. Bowen, M.B.E. T. C. Brooke, D.S.C., to No. 10 (B) Sqdn., Boscombe Down, 20.1.33, for flying duties *vice* S./Ldr. G. H. Hall, A.F.C. I. M. Rodney, to No. 43 (F) Sqdn., Hornchurch, 23.1.33, to command *vice* S./Ldr. S. L. G. Pope, D.F.C., A.F.C. F. J. W. Mellersh, A.F.C.; S. L. G. Pope., A.F.C., to R.A.F. Staff College, Andover, for Staff course (No. 11), 23.1.33. A. W. Fletcher, O.B.E., D.F.C., A.F.C., to No. 203 (F.B.) Sqdn., Basrah, Iraq, 6.12.32, for Navigation duties. A. B. Ellwood, D.S.C., to No. 5 (A.C.) Sqdn., Quetta, India, 12.12.32, to command *vice* S./Ldr. W. K. Mercer.

Flight Lieutenants: A. Hesketh, D.F.C., to No. 13 (A.C.) Sqdn., Netheravon, 16.1.33. O. B. Swain, to Air Armament School, Eastchurch, 19.1.33. F. F. Smythies, to No. 2 Flying Training School, Digby, 13.1.33. F. F. Garraway, to Air Ministry (Dept. of Chief of the Air Staff) (D.O.S.D.), 17.1.33. C. F. Teogood, to No. 2 Flying Training School, Digby, 12.1.33. I. A Bertram; D. W. F. Bonham Carter; W. A. B. Bowen-Buscarlet, D.F.C. (on 22.1.33); W. A. D. Brook; H. H. Brookes; J. A. Elliott; M. H. Ely; B. E. Embry, A.F.C.; C. Hallawell; J. C. E. A. Johnson; S. McKeever, D.F.C.; N. V. Moreton; A. L. A. Perry-Keene; B. H. C. Russell; H. J. Saker; A. F. Scroggs; G. S. Shaw; and T. C. Traill, D.F.C., to R.A.F. Staff College, Andover, for Staff course (No. 11), 23.1.33. J. B. Barrett, to H.Q., Wessex Bombing Area, 26.1.33. J. F. T. Barrett, D.S.O., D.F.C., to No. 47 (B) Sqdn., Khartoum, 26.11.32. D. L. Evans, M.C., D.F.C., to No. 2 Armoured Car Coy., Ramleh, 10.1.33. G. V. Howard, D.F.C., to H.Q., Fighting Area, Uxbridge, 30.1.33. J. L. Kirby, to H.Q., Iraq Command, 3.1.33. J. D. S. Denholm, to H.M.S. *Glorious*, 23.1.33.

Flying Officers: G. A. C. Foster, to No. 4 Flying Training School, Abu Sueir, 17.1.33. A. A. Adams, to No. 604 (Co. of Middlesex) (B) Sqdn., Hendon, 23.1.33. N. Alexander, to Station Flight, Andover, 16.1.33. C. R. Crow, to No. 15 (B) Sqdn., Martlesham Heath, 17.1.33. R. D. Williams, to Central Flying School, Wittering, 18.1.33. F. B. H. Hayward to Air Armament School, Eastchurch, 24.1.33. W. Pickersgill to No. 70 (B.T.) Sqdn., Hinaidi, Iraq, 3.1.33. H. T. Bennett, to Marine Aircraft Experimental Estabt., Felixtowe, 23.1.33. P. B. Coote, to Central Flying School, Wittering, 17.1.33. R. Ellison to No. 501 (City of Bristol) (B) Sqdn., Filton, 19.1.33.

Pilot Officers:

The undermentioned Pilot Officers are posted to their respective units on 17.12.32, on appointment to Permanent Commns. from the R.A.F., College, Cranwell:—R.A.C. Barclay, to No. 25 (F) Sqdn., Hawkinge. A. R. G. Bax, to No. 13 (A.C.) Sqdn., Netheravon. R. L. Bradford, to No. 7 (B) Sqdn., Worthy Down. A. N. Bray, to No. 111 (F) Sqdn., Hornchurch. W. R. Brotherhood, to No. 33 (B) Sqdn., Bicester. L. Coulson to No. 7 (B) Sqdn., Worthy Down. R. G. Coventry, to No. 58 (B) Sqdn., North Weald. E. B. C. Davies, to No. 19 (F) Sqdn., Duxford. J. F. H. Du Boulay, to No. 57 (B) Sqdn., Upper Heyford. D. H. Furze, to No. 111 (F) Sqdn., Hornchurch. A. Golding, to No. 12 (B) Sqdn., Andover. M. Hastings, to No. 9 (B) Sqdn., Boscombe Down. D. S. Kite, to No. 2 (A.C.) Sqdn., Manston. R. J. Knights-Whittome, to No. 16 (A.C.) Sqdn., Old Sarum. I. G. MacKay, to No. 54 (F) Sqdn., Hornchurch. E. D. MacK. Nelson, to No. 12 (B) Sqdn., Andover. M. J. O. Parish, to No. 100 (B) Sqdn., Donibristle. S. P. A. Patmore, to No. 10 (B) Sqdn. Boscombe Down. P. J. Pearson-Rogers, to No. 23 (F) Sqdn., Biggin Hill. D. A. Pemberton, to No. 99 (B) Sqdn., Upper Heyford. J. C. Pope, to No. 3 (F) Sqdn., Upavon. M. K. D. Porter, to No. 2 (A.C.) Sqdn., Manston. A. G. Powell, to No. 26 (A.C.) Sqdn., Catterick. P. R. Robinson, to No. 13 (A.C.) Sqdn., Netheravon, P. S. Salter, to No. 17 (F) Sqdn., Upavon. P. de G. H. Seymour, to No. 26 (A.C.) Sqdn., Catterick. R. G. Stone, to No. 2 (A.C.) Sqdn., Manston. R. T. Smith, to No. 41 (F) Sqdn., Northolt. R. V. Rolph, to No. 43 (F) Sqdn., Tangmere.

H. S. Laws, to No. 40 (B) Sqdn., Abingdon, 23.1.33, for Flying duties, on appointment to a Short Service Commn.

Stores Branch

Wing Commanders: W. E. Aylwin, O.B.E., to H.Q., Coastal Area, Lee-on-Solent, 23.1.33, for Stores Staff duties *vice* W/Cdr. W. J. B. Curtis, O.B.E. G. Stevens, O.B.E., to No. 4 Stores Depot, Ruislip, 23.1.33, to Command *vice* W/Cdr. W. E. Aylwin, O.B.E.

Flight Lieutenant J. F. Young, M.M., to Air Ministry, Dept. of Air Member for Supply and Research (D. of E.), 23.1.33.

Flying Officer M. M. McMullan, to No. 207 (B) Sqdn., Bircham Newton, 23.1.33.

Accountant Branch.

Wing Commander J. Rylands, to H.Q., Inland Area, Stanmore, 23.1.33, for duty as Command Accountant *vice* W/Cdr. T. H. Evans.

Squadron Leader G. N. Simon, to R.A.F. Depot, Uxbridge, 16.1.33, for Accountant duties *vice* F/Lt., J. F. R. Eales-White.

Medical Branch.

Flying Officer D. C. MacGilchrist, to Station H.Q., Donibristle, 9.1.33.

Chaplains' Branch

Rev. H. Thomas, to H.Q., R.A.F., Halton, 20.1.33, for duty as Chaplain (Church of England).

Dental Branch

Flight Lieutenant A. P. McClare, to Station H.Q., Tangmere, 23.1.33.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

Lieuts.—W. G. Williams (F/O., R.A.F.), to *Furious* for 466 Flight (Dec. 23, 1932).

Royal Air Force

Flight Lieuts.—J. D. S. Denholm, to *Glorious* (Jan. 23). C. H. Cahill, A.F.C., to *Glorious* (Jan. 9); and M. H. Jenks, to *Eagle* (Feb. 1).

The Armstrong-Siddeley "Serval I"

The official name of the Armstrong-Siddeley Motors, Ltd., double-row Mongoose IA engine, of 300/340 h.p. at 2,000 r.p.m. sea level rating, is "Serval I."

No. 2 Aircraft Depot, R.F.C. Reunion

It is proposed to hold a reunion of No. 2 Aircraft Depot, Royal Flying Corps, B.E.F., France. All ranks interested are asked to communicate (stating section) with Mr. J. S. Cousins, 86, Colchester Road, Leyton, E.10.

THE LATEST "SOUTHAMPTON": Differing in many respects from the older type, the Supermarine "Southampton" Mark IV is fitted with two Rolls-Royce "Kestrels" mounted under the top plane, a position which gives maximum water clearance for the airscrews. A novel feature is also the enclosed cockpit for the pilots.

VENTILATING GRIEVANCES

(*Concluded from page* 126)

an example of his feeling he quoted that a 400-h.p., 200 m.p.h. seven-seater was more economical than a contraption of glue and plywood driven at 45 m.p.h. by 6 h.p., carrying a man and a boy.

MR. C. H. LOWE-WYLDE acknowledged that he was responsible for the 6-h.p. "glue and plywood contraption" already referred to. He upheld the sporting side of aviation as demanded by the "man in the street" who wanted to fly for pleasure and not as a means of travel. He thought that aerobatics were only taught because existing machines were liable to get into funny attitudes. The machines he visualised would not do so. He thought that high speed was a danger unless it was coupled with a very low landing speed, and asked that the private owner, and the manufacturer of the aircraft for him, should be freed of all legislation control.

MR. C. G. GREY did not agree that aviators did not want speed. He thought that the Avro "Baby" flown by Bert Hinkler to Turin in 1920 was every bit as good as present-day machines, and those flown at Hendon in 1913 were very nearly as good.

MR. HANDLEY PAGE said that motors, ships and aeroplanes did in some respects resemble each other, but only to a certain degree, as in the aeroplane one had to deal with the ability to accelerate vertically. He admired what Mr. Lowe-Wylde had done, but thought that h.p. was necessary in order to get out of difficult situations. (H.P. *is* an adept at that.—ED.) He held the view that there was a field for every type of aeroplane, and the regulations should be controlled in such a way that it would be possible to get the freest development. He would like to see the commercial part of the regulations handed over to somebody like Lloyds. He felt that the Air Ministry were very good friends, and far better than any other Government Department. He asked that we should have freedom to go anywhere, and viewed with alarm the nationalist spirit creeping into aviation. This spirit caused the private owner, when touring abroad, to be looked upon as a spy, and he suggested that this was due to the civil aeroplane being absolutely unjustly linked with national defence and military qualities.

After some questions had been asked, Flt. Lt. Allen moved the motion, which was carried by 60 votes to 3. The further addendum "that this fact is mainly due to the present form of Government control" was also carried.

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Capt. A. B. Rogers

IT is with regret that we have to announce the death of Capt. A. B. Rogers, who died on Tuesday, January 31, as a result of bronchitis. Between 1923 and 1925 he was in charge of B.P. aviation interests at Croydon aerodrome. In 1925, during the Lympne trials, he was involved in an accident, one of the machines overshooting while landing and running towards the crowd; Capt. Rogers managed to divert the machine at the cost of a few damaged ribs. After 1926 he was in charge of the Competition and Racing section of B.P., and in 1931 he took over the control of both Shell and B.P. Racing sections. He leaves a widow and four children.

* * * *

PUBLICATIONS RECEIVED

Aeroplane Design. By R. Rodger. The Association of Engineering and Shipbuilding Draughtsmen—Session 1932-33. The Draughtsman Publishing Co., Ltd., 96, St. George's Square, London, S.W.1. Price 6s. net.

Professional Papers of the Air Survey Committee No. 8. *A Simple Method of Surveying from Air Photographs.* By Lieut. J. S. A. Salt, R. E. London: H.M. Stationery Office, W.C.2. Price 4s. net.

Parallax Tables. Supplement to Professional Papers of the Air Survey Committee No. 8. London: H.M. Stationery Office, W.C.2. Price 1s. 6d. net.

Eighteenth Annual Report of the U.S. National Advisory Committee for Aeronautics, 1932. Administrative Report without Technical Reports. Superintendent of Documents, Washington, D.C., U.S.A. Price 15 cents.

Technical Notes of the U.S. National Advisory Committee for Aeronautics: No. 432. *Drag Tests of 4/9-Scale Model Engine Nacelles with Various Cowlings.* By R. Windler. Oct., 1932. No. 433. *The Pressure Distribution Over a Standard and a Modified Navy Elliptical Wing Tip on a Biplane in Flight.* By R. V. Rhode. Oct., 1932. No. 434. *Influence of Several Factors on Ignition Lag in a Compression-Ignition Engine.* By H. C. Gerrish and F. Voss. Nov., 1932. No. 435. *The Effect of Clearance Distribution on the Performance of a Compression-Ignition Engine with a Pre-combustion Chamber.* By C. S. Moore and J. H. Collins, Jr. Nov., 1932. No. 436. *The Effect of Connecting-Passage Diameter on the Performance of a Compression-Ignition Engine with a Pre-combustion Chamber.* By C. S. Moore and J. H. Collins, Jr. Nov., 1932. No. 437. *The Pressure Distribution Over a Long Elliptical Wing Tip on a Biplane in Flight.* By R. V. Rhode. Dec., 1932. No. 438. *The Gaseous Explosive Reaction at Constant Pressure—Further Data on the Effect of Inert Gases.* By F. W. Stevens. Dec., 1932. No. 439. *Meteorological Conditions During the Formation of Ice on Aircraft.* By L. T. Samuels. Dec., 1932. No. 440. *Flight Tests to Determine the Effect of a Fixed Auxiliary Airfoil on the Lift and Drag of a Parasol Monoplane.* By H. A. Soulé. Dec., 1932. National Advisory Committee for Aeronautics. Washington, D.C., U.S.A.

The Journal of The Royal Air Force College, Cranwell, Lincolnshire. Vol. XIII. No. 1. Spring, 1933. Aldershot and London: Gale and Polden, Ltd.

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NEW COMPANY REGISTERED

SPARTAN AIR LINES, LTD. Capital, £10,000 in £1 shares. Objects, to establish, maintain and operate lines of aerial conveyances, and to carry on the business of carriers or conveyors by air, land and water of passengers and goods, etc. The first directors are to be appointed by the subscribers. Solicitor: H. Davey, 47, Parliament Street, S.W.1.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors.

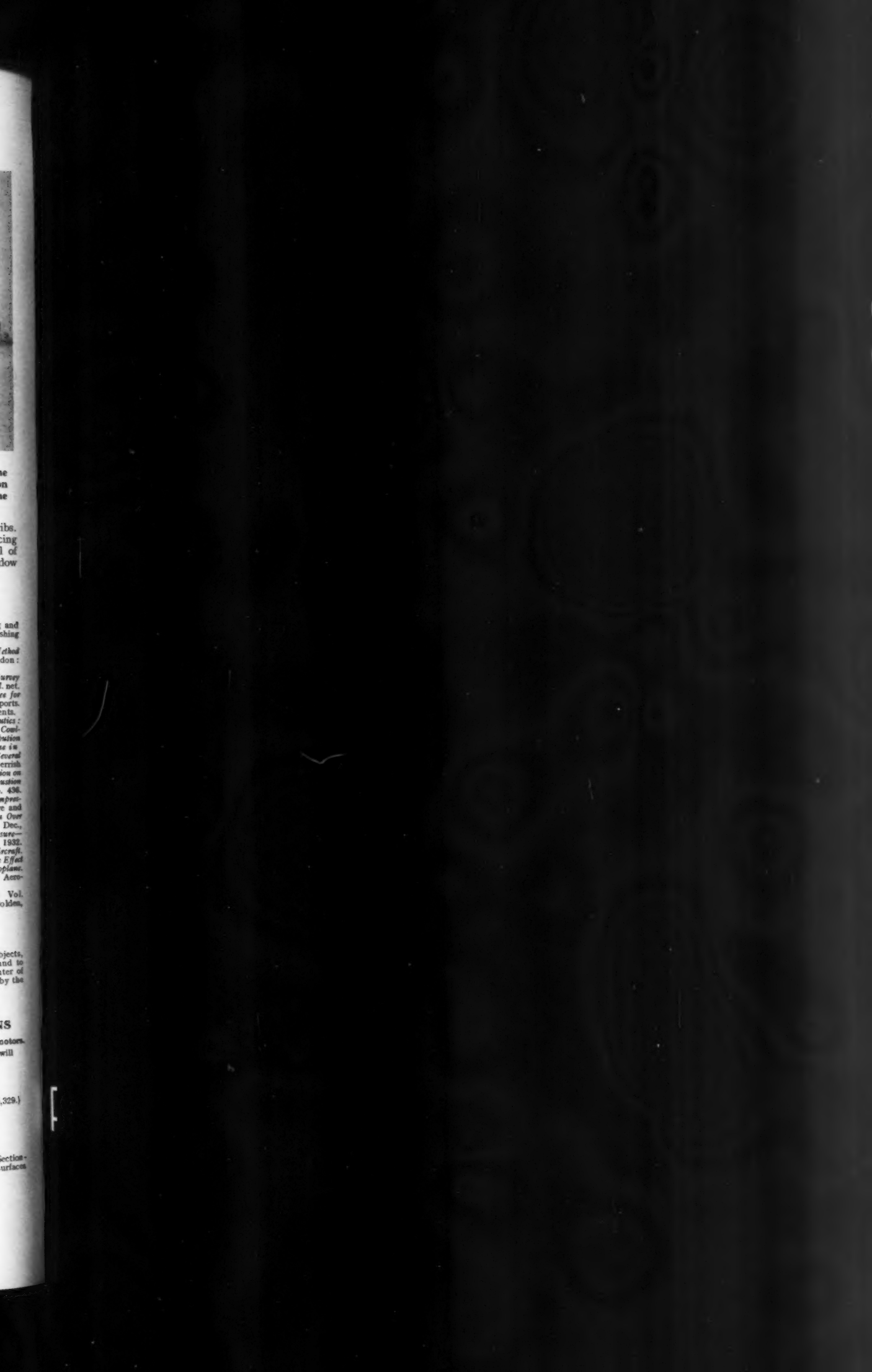
(The numbers in **brackets are those under which the Specification will be printed and abridged, etc.**)

APPLIED FOR IN 1931.

Published February 9, 1933.

10,490. G. L. ESTOPPEY. Bomb sights for use on aeroplanes. (386,329.)
23,781. J. S. MCDONNELL, JUN. Aeroplane. (386,352.)
24,437. L. STIPA. Propellers for aeroplanes. (386,355.)

APPLIED FOR IN 1932.

Published February 9, 1933.

11,520. SOC. ITALIANA E. BREDA PER CONSTRUZIONI MECCANICHE. Sectionally constructed all-metal supporting skin or other surfaces of aeronautical machines. (386,497.)
17,504. A. W. STEWART. Air Screws. (386,551.)